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ABSTRACT

Presented are the results of a study of the possible relationship between learning disabilities (LD) and juvenile delinquency (JD). The project is reported to have included a literature search, a survey of current theories of experts in the field of special education, and an inventory of Law Enforcement Assistance Administration (LEAA) demonstration projects dealing with delinquency and having a direct involvement with LD detection or remediation. Data analysis is noted to have found the case for the "learning disabilities/juvenile delinquency link" to be not strongly documented, but suggestive. Among recommendations given are that LEAA resources be used to support a study of the incidence of LD in delinquent and non-delinquent adolescent populations and a program examining the extent to which LD could be effectively remediated for adolescent delinquents. Appended material includes summaries of the LD/JD studies, an inventory of demonstration projects, and an annotated bibliography of the reviewed literature. (IM)

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The Link Between Learning Disabilities and Juvenile Delinquency

Current Theory and Knowledge

by

Charles A. Murray

with the assistance of
Jane G. Schubert, Adele E. Gunn, Michael D. Casserly, Scott A. Bass,
Philipp P. Harper, Michele Bektemirian and Shirley L. Hines

April 1976

Prepared for the National Institute for Juvenile Justice and Delinquency Prevention, Office of Juvenile Justice and Delinquency Prevention, Law Enforcement Assistance Administration, Washington, D.C.

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PREFACE

Increasing attention has been focussed on the possibility of a relationship between learning disabilities and juvenile delinquency. If these were related, there would be policy implications for preventing or controlling delinquent behavior. Consequently, the Law Enforcement Assistance Administration commissioned the American Institutes for Research to examine the available research literature and anecdotal evidence regarding the "Learning Disabilities/Juvenile Delinquency link," to assess the policy implications of that evidence, and to recommend an intervention strategy, if warranted.

In summary, AIR found the case for such a link to be not strongly documented but suggestive. They recommended that the most effective use of LEAA resources would be to support:

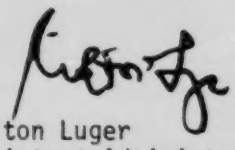
(1) A study of the incidence of learning disabilities in both delinquent and non-delinquent adolescent populations under controlled research conditions;

(2) A program to examine the extent to which learning disabilities could be effectively remediated for adolescent delinquents; and

(3) Monitoring the effects of such a program on their delinquent behavior.

LEAA is following these recommendations and is supporting, through the National Institute for Juvenile Justice and Delinquency Prevention, a major research and demonstration program in three cities representing a substantial cross section of the general population.

We feel that the American Institutes for Research have done a commendable job in examining this topic and in making useful suggestions on the basis of the available evidence. We are pleased to share this document with you.



Milton Luger
Assistant Administrator
Office of Juvenile Justice and
Delinquency Prevention
Law Enforcement Assistance Administration

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INTRODUCTION

The purpose of this report is to assist the Office of Juvenile Justice and Delinquency Prevention in determining what, if anything, the Federal Government should do about learning disabilities as a means of reducing or preventing juvenile delinquency.

"Learning disabilities" (LD) is a young term, created in 1963 to label a variety of dysfunctions which appeared to prevent otherwise normal children from learning at the expected level. The term rapidly achieved widespread use; by 1970, 43 states had adopted official definitions of LD and made provisions for funding diagnostic and remedial programs.

Along with the interest in LD as a "cause" of educational failure, a second avenue of interest developed: might it be that learning disabled children were making up a disproportionate segment of the juvenile delinquent population? The question arose initially because of observations of delinquent children. Their characteristically poor school performance was one source of interest: in many cases, something besides lack of motivation, emotional disturbance, or low intelligence seemed to be at work. The clinical descriptions (e.g., short attention span) were often strikingly similar to descriptions of behavior among LD children. Information of this type led to more systematic attempts to diagnose LD among delinquents. Several projects were started which took LD as a diagnostic category for screening juvenile arrests, or the remediation of LD as a treatment for the remediation of delinquent behavior. Some of these projects were locally funded, some received support from LEAA's revenue-sharing "block grants," and some were financed out of LEAA's discretionary funds.

The growing interest in LD as a cause of delinquency has coincided with the rapidly increasing concern about delinquency itself. During the last fifteen years, delinquency has not just kept pace with the general increases in crime; it has outstripped them. And the increases have been most dramatic among the most serious offenses. A few summary statistics help to convey the magnitude of the changes

and the magnitude of the existing problem:

- Youth arrests for all crimes rose 138% during the fifteen years from 1960 through 1974, while arrests of people 18 years of age and over were increasing by only 16% (Federal Bureau of Investigation, 1974, p. 182).

- Youth arrests for the four violent index crimes--murder, rape, robbery, and aggravated assault--rose 254% during those fifteen years, more than twice the adult percentage increase (Federal Bureau of Investigation, 1974, p. 182).

- These increases in serious offenses far outstrip increases in the youth population. The youth population aged 9 through 17 increased only about 27% during the same period.[1]

- In 1974, the problem had grown to the point that there were almost 1.7 million arrests of youth under 18, more than 80% of them for offenses which would be crimes if committed by an adult (Federal Bureau of Investigation, 1974, p. 186).[2]

Or, as it was noted in the Juvenile Justice and Delinquency Prevention Act of 1974, "Juveniles account for almost half the arrests for serious crime in the United States today" (U.S. Congress, 1974, p. 1).

That same Act authorized the Office of Juvenile Justice and Delinquency Prevention (OJJDP) for which this study has been conducted. The problem motivating the study was put roughly this way: A new office has been created with sweeping responsibilities for the Federal anti-delinquency effort but with very limited resources. The OJJDP cannot afford to be deflected by fads, but neither can it afford to overlook promising approaches. Learning disabilities as an

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[1]Estimated from 1960 and 1970 census data as reported in the 1972 Statistical Abstract of the United States, Tables 7 and 33.

[2]Only 18.1% of the total arrests were for the curfew violations, runaway, and liquor law violations which are the principal sources of status offense included in the FBI's *Uniform Crime Reports*.

explanation for delinquency may be a fad or a promising new approach, depending on who is presenting the case.

Thus this study is a reconnaissance. Its purpose is *not* to help implement an already formulated policy relating to LD. It is *not* to extend the state of our knowledge about the link between LD and delinquent behavior. The project was created to develop an objective review of the issue as an aid to OJJDP decision-making.

The first section describes the conduct of the research. The study then moves to a discussion of the following questions, from an explicitly policy-oriented viewpoint:

- What, in summary, is "learning disabilities" all about? How is the term defined? What does it exclude? What are the main points of consensus and dissension which impinge on the OJJDP's interest in LD? (Section II)

- What is the rationale for arguing that LD is a major cause of delinquency? How does it fit into what we know or think we know about the causes of delinquency? (Section III)

- What is the hard evidence linking LD to delinquency? Is it logically persuasive? Is it methodologically persuasive? To what extent do we know enough already; to what extent should the link be the object of further study? (Section IV)

Findings on these questions are the subject of Sections II through IV. Section V presents conclusions and recommendations. But among and even within those sections, the approach of the study shifts radically.

The discussion of LD as a set of phenomena (Section II) is descriptive and non-technical. Since the phenomena themselves and their diagnoses can be very technical, the discussion in this study is properly called a primer. Then, the discussion turns to the definition of LD (Section II), and subsequently to the discussion of the LD/JD link (Sections III and IV). We have tried to be extremely explicit and technical in the critique, occasionally to the point of being pedantic. We did so because clarification is essential--during the course of data collection, we steadily upgraded the proportion of the LD/JD controversy which appears to be attributable to semantics instead of substance. Still another shift in tone occurs in Conclusions and Recommendations (Section V). The process of trying to pin down what is known about LD as a cause of delinquency, or the remediation of LD as a cure for delinquency, produced more possibilities and implications than can be fully documented with the

available data. We report speculations in Section V along with the more solidly grounded findings, trying to be clear about which is which.

I. DESIGN OF THE STUDY

A. Staff

The study was carried out from September through December, 1975, by staff of the Washington Office of the American Institutes for Research. The study was directed by Dr. Charles A. Murray, who was responsible for the overall conduct of the research and was principal author of the final report. Dr. Jane G. Schubert and Dr. Scott A. Bass had special responsibility for the discussion of learning disabilities. Mr. Philipp P. Harper had responsibility for the inventory and analysis of existing demonstration programs which relate LD and delinquency. He was assisted in that task by Ms. Michele Bektemirian. Ms. Adele E. Gunn conducted the literature search for material on the LD/JD link. She and Ms. Shirley L. Hines prepared the annotated bibliography of that literature. Mr. Michael D. Casserly had special responsibility for the literature survey of alternative causal explanations of delinquency. All of the staff members participated in the interview of consultants.

B. Data Collection Procedures

The study entailed three types of survey relating to the LD/JD link: surveys of the existing literature, of current theoretical developments, and of the existing practical applications. A description of the procedures for each of these surveys follows.

1. *Literature Search.* The objective was to conduct a comprehensive review of all literature which dealt directly with the LD/JD interface and more selective reviews of the literature on LD and JD as separate fields.

The searches of the LD literature focused on titles which dealt with

- definitions of terms and typologies of disability,
- diagnostic techniques,
- treatment techniques, and
- epidemiological data.

The searches of the delinquency literature focused on titles which dealt with

- causal explanations for delinquent behavior,
- quantitative baseline data on incidence and offender types (especially pertaining to education-related variables), and
- theoretical typologies of offenders.

The rule of thumb in searching for work on the LD/JD link was to tag any title (or abstract) which appeared to discuss schools and delinquency, intelligence and delinquency, neuropsychological topics and delinquency, general achievement and delinquency, or handicaps and delinquency.

The following sources were included in the literature search:

- The Educational Research Information Clearinghouse (ERIC): computer and manual search.
- NIMH information system: computer search.
- *Psychological Abstracts*: computer and manual search.
- National Council on Crime and Delinquency: catalog search.
- National Criminal Justice Reference Service: computer and catalog search.
- NIMH Center for Studies of Crime and Delinquency: interview.
- DHEW Office of Youth Development: catalog search.
- Council for Exceptional Children: computer search.
- *Sociological Abstracts*: manual search.
- *Crime and Delinquency Abstracts*: manual search.
- *Crime and Delinquency Literature*: manual search.
- University of Maryland Library: catalog search.

We routinely obtained copies of all titles cited in the bibliographies of articles which reviewed the literature pertaining to the relationship between LD and delinquency. And finally, some pieces were obtained circuitously, while conducting inquiries about current projects. Many of the relevant manuscripts have not been published, and reside in the files of municipal youth bureaus or university graduate departments. Eventually a point was reached at which no new titles were forthcoming. A very few items (speeches presented at conferences) have not been obtainable; otherwise, the complete texts of the titles in question were examined. We must assume that the annotated bibliography in Appendix E is not an absolutely complete listing of the LD/JD literature--there is always the stray title that is missed--but it is believed to be very close to complete, in terms of the literature as of the end of 1975.

2. *Survey of Current Theory*. The published literature typically lags behind actual developments. Even more importantly for our purposes, it seldom reflects current states of consensus and dissension on the critical topics. From the outset of the study, it was assumed that a major source of information must be experts in the LD and JD fields.

We identified the consultant group iteratively. Members of the A.I.R. staff whose specialty was special education or delinquency drew up lists of the most widely recognized names in each field, with summary comments about each person's special expertise. We also considered "ideological" factors. The fields of LD and delinquency both are characterized by differing theoretical schools of thought. No attempt was made to interview a representative sample--we frankly do not know what "representative" might mean in terms of a sample of experts. But we did attempt to ensure that we interviewed persons holding a broad range of perspectives on LD and delinquency.

The top of the list--those whose specialties and reputations made them obvious first choices for a study of this type--were telephoned. We explained the nature of the study and our interest in obtaining their participation. Further, we asked who *they* thought was currently doing the best work on relevant topics. Their nominations were added to the list. For each subarea, the same names kept reappearing. The degree of consensus was high. Even if--to take just one example --a respondent did not find personality studies of delinquents useful, he would probably recommend a Herbert Quay as a man "you ought to talk to," as being an able member of (in his view) a misguided lot.

Through this process, we identified a core of key people. Once the key persons were identified, we made arrangements to interview them and others, both in research and demonstration projects, who were in the same geographic area.

In all, forty-six persons were interviewed for periods ranging up to a full day, plus (in many cases) follow-up interviews by telephone. Names and positions of those interviewed at length are given in Appendix A. They include academicians, judges, members of correctional staffs, clinicians working with disturbed youth, and educators who are implementing advanced remedial techniques for LD and other learning handicaps. Our overall assessment of the group is that (a) it is not complete--some prospective consultants were not available--but that (b) it includes some of the most able, well-informed authorities in the delinquency and LD areas, representing a broad spectrum of approaches to both topics.

3. *Inventory of Demonstration Projects.* The search for demonstration projects took as its basic source a printout of all LEAA grants and subgrants which dealt with delinquency, from 1972 through the present. The listing was current as of November 1975. No attempt was made to delimit the search to projects which dealt with education; the abstracts for *all* delinquency-related projects were examined. All projects which could plausibly be expected either to diagnose or to treat LD as part of their operation were identified and assigned to one of six categories. Three groupings were designed to accommodate those projects whose printout summaries identified them as having a direct involvement with LD detection or remediation:

1. Projects involved exclusively with LD.

2. Projects limited to educational interventions which possessed an LD component.

3. Broad-based projects possessing an educational component which, in turn, was involved in part with LD.

The remaining categories included projects for which involvement of LD was deemed possible, although such links had not been identified in the printout summaries:

4. Projects based solely on educational interventions (e.g., remedial education and alternative education).

5. Broad-based projects which included an educational component.

6. Projects not involving education but based on evaluation or diagnosis of juveniles.

Telephone research was conducted for all FY 1974 and FY 1975 projects covered by the six categories. Such investigation was not carried out for the 1972 and 1973 projects: exploratory efforts revealed that it would be possible to track down only a fraction of those which, for the most part, had already been phased out.

When it was found that a project did have an LD-related component, information was obtained about operational objectives, diagnostic tools, remedial techniques, number of participants, and any available evaluative information. An abstract of each of the directly related projects and tables summarizing the budget data for all of them are given in Appendix D.

It should be assumed that the inventory is not complete. Some relevant LEAA-sponsored projects presumably were missed because the abstract gave no hint of the LD component, or because they had been started too late to be included in the November 1975 printout. Most importantly, state-sponsored projects could not be inventoried systematically.

C. Data Analysis

This study does not present analyses of primary data. It reviews and assesses the work of others. In this sense, there were no formal analytic procedures. We did, however, apply two guidelines which may be useful in interpreting the report.

The first of these was to distinguish data from theory. In both the literature and discussions with consultants, it became apparent that opinions on the LD/JD link are far more abundant than facts. This was true both of the arguments for and the arguments against. A conscious, even pedantic effort was made to disentangle the kernel of established fact from speculative statements.

The second analytic guideline was to break the subject matter into the smallest possible units, before trying to reaggregate the material into "findings." Thus the rationale for the LD/JD link (Section III) is broken into discrete causal steps; the literature on incidence of LD among delinquents (Section IV) is treated not only in terms of the individual articles, but the individual tests that were used and the procedures for administering and scoring them.

There is a common danger in both of these guidelines, that we become preoccupied with minutiae. We are particularly aware (and defensive) of this, because of the frustration communicated to us by many advocates of the LD/JD link who are deeply convinced that the problem is being studied to death. But the guidelines are intended to produce a benefit which, to our knowledge, is unique among

the existing reviews of LD as a cause of delinquency: it is a presentation which permits an examination of "minutiae" of logic and of evidence, independent of the conclusions which we as researchers have drawn from their aggregation.

A note on presentation. In general, the discussion refers to consultant viewpoints without naming who said what. After trying drafts written both ways--with attribution and without--we concluded that the added weight of tagging specific statements with specific names was not worth the potential harm. For we did not conduct the interviews in a format designed to remind the consultants that anything they said was fair game for a quote. On the contrary, we encouraged them to speculate, synthesize and interpret the literature on extremely complex topics, and generally act as a source for pulling together strands of current thinking in ways that the published sources could not. To encourage this kind of free-wheeling discussion and then attribute their statements in the same way that we cite their articles seemed too much like having it both ways. The practice, therefore, has been to list the names of those persons who contributed most to a given topic, then summarize the themes of consultant responses, using published statements when a particular consultant is cited. The major exception to this rule is the discussion of LD personality traits and delinquent personality traits in Section III, for which three consultants--Hursch, Quay, and Warren--dominated the contributions.

II. LD: A PRIMER AND A DEFINITION

This section has two purposes. First, it describes for the nonspecialist what "learning disabilities" means, or has been taken to mean by students of the field. It goes on to describe the general state of the art in diagnosing and treating these conditions. The section then turns to the problem of definition. The phrase "learning disabilities" started as a label. It is an elastic term, and specifying the nature of the elasticity is extremely important in making sense of the discussion of the LD/JD relationship in subsequent sections of the report.

A. The Primer

The term "learning disabilities" was first given currency by Samuel Kirk in the early 1960's, although research into learning problems has longer historical roots. Learning disabilities was intended as a label: a convenient way of referring to a variety of learning problems which apparently were not caused by low intelligence, emotional disturbance, physical handicaps, or incompetent teachers. As a label, it was not originally meant to have diagnostic utility. A child could be called "learning disabled," but not because he had a learning disability in the same sense that a child "has" pneumonia.[1] Yet, despite its lack of a specific construct, the phrase had other potential utilities which rapidly increased its popularity. One of these was that it gave parents a non-pejorative way of referring to children who were doing poorly in school. Another and more important reason was that the phrase "learning disabilities" met a substantive need. Generic similarities did exist among a variety of learning problems, and LD provided a rubric under which those similarities could be grouped.

Use of the term "learning disabilities" has grown rapidly. In 1964, a society was formed called the Association for Children with Learning Disabilities (ACLD). States adopted official definitions of learning disabilities--43 of them by 1970. Seminars and conferences of academicians are routinely held to discuss LD.

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[1] The use of the masculine pronoun is not only convenient, but appropriate. As mentioned elsewhere, male LD children appear to outnumber female LD children by ratios commonly estimated to be about four to one.

Professionals representing numerous disciplines have become specialists in learning disabilities. University departments exist to train teachers as specialists in the instruction of LD children. Divisions created to study LD exist within national professional organizations. In short, LD has secured a firm (if sometimes controversial) place in the lexicon of fields which are concerned with the development of children.

There are many ways to define the boundaries of the domain of learning disabilities and few elements of complete agreement. One of the most widely disseminated attempts to forge a consensus was the adoption of the following definition by the National Advisory Committee on Handicapped Children.

> Children with special learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or using spoken or written languages. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling, or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia, etc. They do not include learning problems which are due primarily to visual, hearing, or motor handicaps, to mental retardation, emotional disturbance, or to environmental disadvantage. (Hobbs, 1975, pp. 301-302)

The *spirit* of this definition is generally accepted by 43 states and the ACLD. Some states have adopted modified versions of this overall theme, but none of them stray from its sense--the criteria for receiving federal funds for programs in learning disabilities are based on this definition (Vaughn and Hodges, 1973). But the definition of LD follows from observed behaviors, and probably the best way of introducing the subject of learning disabilities is to describe not how it is defined, but how it appears to parents and teachers.

1. *Symptoms and Types.* The symptoms most commonly associated with learning disabilities are probably those which are also associated with language. The child cannot distinguish "d" from "b," or he confuses and mixes letters (reads "shop" for "hops," for example). When asked to read aloud, the child may omit letters and syllables. Perhaps he will repeat a set of nonsense syllables as he struggles to say a sentence. Or, in milder cases, he may exhibit an inability to use a word he knows, until someone has said it for him. When spoken to, the child may be unable to process spoken language at a

normal speed. He may lose track of spoken instructions after the first few words, and thereby do part of a task precisely as told and then completely ignore (or misconstrue) the rest of it. Other symptoms that suggest an impairment of language functions include: an inability to distinguish between close sound gradations (dip for tip), or inability to associate letters with a corresponding visual symbol, or inability to reproduce rhythm sequences by tapping them with a finger.

Language is not the only context which leads to a diagnosis of an LD condition. A child who is otherwise bright and motivated may show an inability to differentiate left from right, up from down, front from behind. Or he may be unable to process perceptions of speed and weight--so that when the ball is thrown to him, he is never ready to catch it; or when he shuts a door, he slams it unintentionally. He may misperceive distance--when he tries to hang his coat on a hook, he misses by a few inches.

A common characteristic of the learning disabled child is that he exhibits more than one type of disorder. He reverses letters *and* is clumsy *and* has a short attention span. Or the disorder may be interactive, involving more than one sense--he can read in a quiet room; he cannot read when any sounds are within his hearing. The multiple-disorder, multiple-modality characteristic raises questions about the utility of subdividing the disorders at all; and not surprisingly, it has resulted in variations of terminology. But out of these variations, three diagnostic terms have gained widest usage: dyslexia, aphasia, and hyperkinesis, each of which is outlined briefly below.

Dyslexia. The best known of learning disabilities, dyslexia, usually implies reading problems--"word blindness," as it was originally called. Dyslexia embraces a variety of problems in visual processing of language. In its extreme forms, it can produce nearly total inability to absorb meaning from written symbols, even though the victim of it may be able to understand spoken information with normal or above normal intelligence. Overlapping terminology includes specific reading disability, primary reading retardation, strephosymbolia, and dysembolia.

Aphasia. Aphasia is a broader term than dyslexia, and encompasses language processing difficulties which can also be called dsylexic. But the basic distinction is that aphasia deals with auditory and speech deficits in addition to some visual ones. The symptoms mentioned earlier involving nonsense syllables and inability to understand spoken language at normal speed are aphasic problems.

Again, the range of severity is great, from being unable to vocalize an occasional word to an inability to use language comprehensibly. Overlapping terms for aphasia are congenital auditory imperception, congenital aphasia, and developmental language disability.

Hyperkinesis. The word "hyperkinesis" is widely familiar to nonspecialists--often as a synonym for hyperactivity--but it is not as commonly assumed to be a learning disability. Its core meaning is abnormally excessive muscular movement, ranging from the large muscles that move legs to the very small ones that move eyes. Note that hyperkinesis is *not* synonymous with hyperactivity. The problem of the hyperactive child can be wholly emotional and psychological in origin; the hyperkinetic child is thought to have problems which will eventually be traceable to neurological origins. The distinction can be a fine one, as in so many of the etiological issues surrounding LD. Obviously, too, mild cases of hyperkinesis blend easily into the normally frenetic behaviors of children. But genuine hyperkinesis can have an unequivocally disabling impact on learning. When it is literally impossible for a child to remain attentive for more than, say, a minute at a time, he is going to experience extreme difficulty in absorbing information as it is ordinarily communicated in the classroom. In addition to a short attention span, hyperkinesis can be characterized by symptoms of impulsiveness, irritability, social awkwardness, and clumsiness.

These brief and, it should be emphasized, technically imprecise outlines are intended to convey the nature of LD and its principal types. A theme which may already be apparent is that the "legitimacy" of a symptom is related to the degree to which it appears to have organic origins. The discussion now turns to this issue: the causes of learning disability.

2. *Causes.* Very little is known about the causes of LD. So little, that one motivation for using the phrase "learning disabilities" is that it is free of implications about causes. Other terminology does have etiological implications. Children who are called learning disabled are also widely labeled as "brain-injured," or as suffering from "minimal brain dysfunction." But whenever this terminology is applied, the objection can be raised that no medical techniques currently available can determine the location or nature of the brain damage for many types of "brain-damaged" children. The question is asked: if the neurological base is only inferred, why insist on incorporating it into the label? "Learning disabilities" is to this extent a matter of word substitution for other terms.

Nonetheless, organic cause remains the most economical explanation for many LD symptoms. Perhaps the simplest way to put it is that the behavior patterns which lead to diagnoses of these disorders are ones which *look as if* they result from an organic base. If an otherwise bright, cooperative child of appropriate age cannot do things.

like copy a simple geometric shape, there are few plausible explanations except some sort of neurological impairment.

The more ultimate question of what causes the impairment is even less well-informed. Genetics may play a role. Several consultants noted that the parents (particularly fathers) of a learning disabled child would sometimes say that "I didn't worry about it for a while, because I was just like him when I was a boy," and these consultants speculated that systematic research would reveal family histories of LD. Another candidate cause is pre-natal brain insult to the fetus, perhaps from nutritional, physical, or drug-related sources. Still another possible source of impairment is nutritional deficiencies in infancy and early childhood, or side-effects of food additives. Finally, extreme degradation of the physical environment--the very high levels of air and noise pollution and crowding in urban slums, for example--was raised as an explanation worth investigating. But at present all these are essentially hypotheses. Prevention of LD by working with causes is not yet a feasible option.

3. *Diagnosis.* In their most severe forms, many symptoms of LD can be dramatic and unambiguous. But in the mild and moderate case, any one manifestation of a learning disability can be confused with a variety of other conditions. This is best illustrated by returning to a few of the LD symptoms which were listed earlier. When, for example, a child has a very short attention span, he may be suffering from the type of LD with the generic label of hyperkinesis. But he may also be a "nervous" child for any number of environmental reasons, or he may be reacting to a history of frustrations in school, the teaching materials may be boring, or he may simply be immature--some first graders are 6½ years old, some are 5½ years old, and the extra year makes a difference. The example of the child who goes to hang his coat on the hook and misses is another illustration of the ambiguity. He may indeed have a perceptual disorder which prevents him from moving his arm in accordance with visual information about distance. But he may instead need glasses. And he may miss the hook because he does not particularly care whether the coat gets hung up.

The obvious question raised by this ambiguity is whether the LD child can be diagnosed accurately. In our discussions with the consultants, the question was put in two forms. The first was, is it possible to diagnose LD reliably, even under the best of conditions? The second was, is it possible to diagnose LD reliably on a mass scale?

The answer to the first question was widely agreed to be yes, if a skilled diagnostician is in charge. By determining patterns of behavior, combining the results of a variety of tests, and running these data through the mind of an experienced observer of LD children, a learning disability can be distinguished from general retardation, emotional disturbance, and (in nonclinical language) ordinary contrariness or laziness.

The answer to the second question was as widely agreed to be no: reliable diagnosis of LD cannot yet be conducted by nonspecialists using standardized instruments. There is as yet no set of tests for learning disabilities which can be administered and interpreted with the ease and routinization of an IQ test or a College Board examination. Or to put it another way: no test battery which has learning disability as its construct has achieved wide acceptance among professionals in the field. Very few have even been attempted.[1]

This state-of-the-art of LD diagnosis raises two important implications which will figure throughout the rest of this report.

The first of these derives from the subjectivity of the diagnostic process. *Symptoms of LD can be found in nearly anyone, given an expectation that they will be found.* LD poses yet another instance of the problem which scientists forced to make subjective judgements have always faced, of tending to find what one is looking for.[2] One consultant referred to it as the medical student syndrome, whereby a first-year student regularly discovers he has the disease covered in the current chapter of the textbook.

The second implication derives from the unavailability of adequate standardized procedures for diagnosing LD. In view of the fact that standardized procedures *are* being used to diagnose LD in public schools throughout the country, the implication is obvious that these diagnoses are of questionable reliability. And several consultants were emphatic about the dangers associated with this. Even among experts who were most convinced of LD's importance as an educational issue, concern was expressed about the way that LD is being identified. As one of the most prominent ones put it, "Don't advise a major government agency on the basis of the hysteria in the public schools."

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[1] This statement was said to hold true even after definitional confusion about LD has been taken into account. Even people who share a common understanding of "perceptual or integrative disorder" have no set of tests for which the scores alone are adequate to diagnose LD.

[2] We observed it in ourselves. At one point or another during this study, nearly every member of the project staff seriously suspected that he or she had an LD child, an LD sibling, or had once been LD.

4. *Incidence.* Despite the widespread interest in learning disabilities, there are no adequate epidemiological data: no one knows what proportion of U.S. children suffer from learning disabilities, at what levels of severity. There are estimates; there are claims made on the basis of diagnostic rates in the public schools, but the LD specialists interviewed for this study unanimously agreed that sound data on a representative sample of children had not been collected as of 1975.

To get a sense of the magnitude of incidence, we did ask each of the consultants on LD to give a best guess, based on his or her personal experience and knowledge of the literature. It was emphasized when the question was asked, and it is re-emphasized here, that the resulting estimates are to be treated as best guesses rather than as "probable incidence." For uniformity, each consultant was asked to apply the National Advisory Committee's definition of LD (see p. 12) to estimates of (a) percent of all children aged 10 years or under who are LD, and (b) percent of LD children who are male. As Table 2.1 indicates, the median estimates were that 5% to 10% of the population of children through age 10 are LD, as defined by the National Advisory Committee's definition; and of these roughly 80% are male. By implication, these estimates imply incidence among male children of roughly 8% to 16%.

TABLE 2.1
Incidence of LD as Estimated by the LD Consultants

			Number of consultants estimating this figure n=14*	
PERCENTAGE OF CHILDREN THROUGH AGE 10 WHO ARE LEARNING DISABLED:				
Estimated minimums	Low estimate	2	3	**Median estimated range:**
	High estimate	17	1	
	Median estimate	5	5	
Estimated maximums	Low estimate	2	1	**about 5–10% of all children through age 10**
	High estimate	40	1	
	Median estimate	10	6	
PERCENTAGE OF LD CHILDREN WHO ARE MALE:			Number of consultants estimating this figure n=12*	
Estimated minimums	Low estimate	70	1	**Median estimated range:**
	High estimate	90	1	
	Median estimate	80	6	
Estimated maximums	Low estimate	80	6	**about 80% of LD children are male**
	High estimate	96	1	
	Median estimate	81.5	—	

* Of the consultants interviewed, 18 had special qualifications in special education or related disciplines. Of these, four declined to respond, or responded using a definition of LD different from the one specified. An additional two did not specify the estimated proportion of LD children who are male.

B. An Approach to Definition for this Study

The preceding primer has assumed that "learning disabilities" is a meaningful term. It is an assumption which many would dispute. LD has become an exceedingly hot issue in the past decade, characterized by debates which appeal as often to ideology as to data. At the same time, a definition is essential for this study and for the OJJDP's policy decisions. A commonly understood vocabulary is a prerequisite to a discussion of the LD/JD link. So on the following pages we attempt to describe the dimensions of dissension and of consensus, and to define our terms for purposes of this study.

The dissent is of two kinds: objections to the *popular usage of the term*, and issues of its *conceptual validity*.

1. *Popular Usage*. "Learning disabilities" has become encrusted with several negative connotations which have very little to do with the original concept or its utility.

The first of these is the generality of the term, leading to what could best be described as intellectual affront at having to use it at all. "It is a kitchen sink term," was one consultant's response; another called it a "garbage can concept." All the dissenters made the general point in one way or another: "learning disabilities" is a label; its increasing use as a diagnostic term is illegitimate.

Some attacked it as an essentially political creation which is attached to children in numbers that maximize local school subsidies for special education programs. In California, for example, a school is said to receive an additional $620 per year for each child diagnosed as EMR (educable mentally retarded), and $1,800 for each child diagnosed as learning disabled. "Labeling kids as LD's has become a lucrative business," was one consultant's comment.

Others pointed to its use as a social euphemism--now middle class parents have a non-pejorative alternative to calling their children retarded, or emotionally disturbed, or poor students. "LD" makes parents feel better without usefully describing the needs of their children.

Still another group pointed to misuses with racist implications. In states which have an 80-point IQ cutoff to distinguish mental retardation from LD, it happens suspiciously often that EMR classes end up being all-black while the LD classes are all-white.

These many objections to the way LD has been used often obscured attempts to discuss its underlying meanings. Some consultants were so hostile to the label that it was difficult to pin down what they thought about the reality of the phenomena grouped under the LD umbrella. Nonetheless, real differences were expressed about what LD means or should mean. The most important of these differences are summarized below.

2. *Issues of Conceptual Validity.* The first major controversy in the conceptual definition of LD is *the extent to which it--or its constituent disabilities--exist independently of diagnoses and definitions.* To take a simple contrast as an example: blindness is intrinsically a disability; the value of sight and the deprivations of blindness are self-evident. But dyslexia is a disability only insofar as reading is important. For all practical purposes, it does not exist until society creates the conditions which make inability to read a handicap. And if the word "school" is substituted for "society," it was argued, a variety of other symptoms of LD should be seen not as disabilities but as behaviors which do not match school norms. Insofar as those norms have weak external validity, they arbitrarily impose the connotations of "disability."

A second major issue was *the extent to which learning disabilities are developmental phenomena.* It was commonly agreed by the consultants that LD symptoms tend to disappear or moderate in adolescence. But some consultants were especially concerned with the implications of this: if it is true that the bulk of the phenomena usually called "LD" are the result of differential rates of development, then we need to rethink our theoretical view of the syndrome, the design of treatment strategies, and the use of labels we now attach. There is nothing "wrong" with the child except that his development timing is out of synchronization with some members of his age group--a far different type of deviance than being "learning disabled."

A third source of conceptual argument is the *etiological vagueness of LD.* The conservative definition of LD rejects phenomena which are caused by environmental disadvantage, and restricts itself to phenomena which have the outward characteristics of a neurological disorder. But, as we noted earlier, little progress has been made in tracing the symptom back to the hypothesized neurological basis. This when a definition of LD tries to employ etiological characteristics as a means of distinguishing "LD" from "not-LD," it leaves itself open to a number of theoretical objections. A principal one is the charge that assuming organic cause triggers additional assumptions that we should be pointing toward new ways to "treat" and "cure" LD with medication and new instructional techniques. This, the critics charge, is an antiseptic approach which tries to ignore the many ways in which LD phenomena do interact with the environment and with institutional norms.

The several conceptual objections to the LD label are grounded in a common concern for the children who are labeled with it. For while "learning disability" may be a non-pejorative term in parents' eyes (or at least socially more acceptable than the alternatives), it is not neutral to or for the child. "It is used against socially failing kids," was one comment, and that typifies the concern expressed by some other consultants that children are bearing the consequences of institutional failures to view LD symptoms in the proper social and developmental frameworks.

Against this is what might be termed the mainstream viewpoint of LD, stated roughly as follows: there exist perceptual and integrative disorders in children which differ in kind from the many other ways in which a child may be handicapped by his background, his general intelligence, his physique, or his personality. They are not artifacts of tests; they have an objective reality. They cannot safely be left to developmental catch-up; early treatment is indicated. They cripple the child's ability to succeed in the academic setting and, "artificial" or not, that setting is a crucial one in preparing the child to succeed as an adult.

3. *The Definition for this Study.* The definition employed in this study is based on two practical considerations relating to the OJJDP's interest in the subject.

The first of these is that the *OJJDP's definition of learning disabilities should be in the mainstream.* No purpose is served by choosing a definition which fits the OJJDP's predilections but which requires it to constantly remind grant applicants or other agencies that OJJDP's use of "LD" differs from all the others. We believe it is appropriate to adopt a *definition for this study which is consistent with the National Advisory Committee's definition,* quoted at the outset of this section. It is one which underlies the States' definitions; and it appears to have achieved a widely shared "understood meaning" among the consultants, despite the ambiguities which persist in its wording.

The second consideration is that *the OJJDP's definition of LD should be consistent with the reasons for the OJJDP's policy interest in LD.* The OJJDP is interested in the field of learning disabilities because some people claim that LD causes delinquency, and it is the OJJDP's business to be interested in causes of delinquency. But *to be a cause of delinquency, the learning disability must in fact be disabling.* The arguments linking LD and delinquency necessarily depend on the assumption that the learning disability significantly affects the child's behavior and achievements; not just that it shows up in the subtle ways on test batteries. The National Advisory Committee definition does not specify a threshold of severity; in this study, we shall.

With these comments as preface, the definition applied in this study is as follows.

Conceptually, we shall apply a recent formulation reached collaboratively by several leading authorities in the LD field: a learning disability will be used to refer to "those children of any age who demonstrate a *substantial deficiency in a particular aspect of academic achievement because of perceptual or perceptual-motor handicaps, regardless of etiology or other contributing factors.*" (Wepman et al., 1975, p. 306. Emphasis added).[1]

Operationally, we include as learning disabilities the perceptual and perceptual-motor handicaps which are often labeled as dyslexia, aphasia, or hyperkinesis, and which meet these diagnostic criteria:

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[1]The advantages of using these established terms are judged to outweigh the advantages of greater specificity. For the record, this study generally subscribes to the discussion of operational characteristics which follows the conceptual definition in Wepman et al. It is worth quoting at length: "The term *perceptual* as used here relates to those mental (neurological) processes through which the child acquires his basic alphabets of sounds and forms. The term *perceptual handicap* refers to inadequate ability in such areas as the following: recognizing fine differences between auditory and visual discriminating features underlying the sounds used in speech and the orthographic forms used in reading; retaining and recalling those discriminated sounds and forms in both short- and long-term memory; ordering the sounds and forms sequentially, both in sensory and motor acts ...; distinguishing figure-ground relationships ...; recognizing spatial and temporal orientations; obtaining closure ...; integrating intersensory information ...; relating what is perceived to specific motor functions.... Behavior disturbances, severe mental retardation, poverty, lessened educational opportunity, visual impairment, hearing loss, or muscular paralysis all may produce educational problems but do not fall into the classification of specific learning disabilities. For example, a child who is deficient in learning because of an emotional disturbance, but who shows no perceptual or perceptual-motor problem, would not be classified as having a learning disability. On the other hand, a child who is deficient in learning because of a nutritional problem, and who also shows a specific perceptual or perceptual-motor deficiency preceded by a nutritional problem, would properly be classified as having a learning disability...." (Wepman et al., 1975, pp. 306-307. Emphasis in the original) The major question we would raise about this approach is whether it is operationally possible to disentangle the relative contribution of various problems to learning deficiencies.

(1) The diagnosis should be based on *evidence which cannot as easily be interpreted* as a manifestation of mental retardation, physical handicap, emotional disturbance, or environmental disadvantagement. This does not mean that each individual indicator must be unambiguous, but that the diagnosis should be based on triangulated measures which permit a *pattern* that is inconsistent with the alternative explanations.

(2) The diagnosis should be accompanied by *evidence that a discrepancy exists between achievement and expectation.* For example, that a child may be demonstrated to occasionally reverse letters does not constitute a learning disability if the child is reading and writing at the level expected of that age and intelligence.

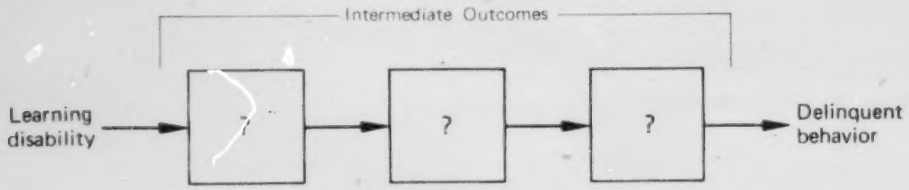
These definitions, too, are far from being as clear-cut and as self-explanatory as one would wish. The nature of the label is such that loopholes and grey areas persist. But throughout our discussions with the consultants, the notion developed that there is a common-sense substratum of meaning to "learning disabilities" which is understandable and not really much more ambiguous than other terms we use with far less definitional fuss. As one writer expressed this underlying sense of the phrase:

> [A learning disability] consists of a deficiency in learning *despite* adequate intelligence, hearing, vision, motor capacity, and emotional adjustment. These children differ (especially from the mentally retarded) in that normal capacity for learning exists, and in that *normal outcome is anticipated* (Myklebust, 1968, pp. 1-2. Emphasis in the original).

The subsequent discussion of the LD/JD link proceeds on the basis of this general approach to learning disabilities.

III. THE RATIONALE FOR THE LD/JD LINK

It is not intuitively obvious that a learning disability will cause delinquency. A causal chain is implied: The LD produces effects which in turn produce other effects which in turn produce other effects which ultimately produce delinquency. Diagrammatically, the general form is as follows:



The chain--we will call it the "rationale"--is only occasionally spelled out when a causal argument is presented in the social sciences. But implicit or explicit, it is a crucial part of the evidence. A statistical relationship between the states of "being learning disabled" and "being delinquent" has to make sense causally as well as pass the statistical litmus test. The more detailed the specification of the intermediate steps, the easier it is to examine the dynamics which will make a correlation coefficient or a t statistic meaningful. In this section we will review the causal rationale under three headings: its basic logic, the evidence presented for that logic, and how the rationale fits into the broader context of what is known about delinquency.

A. The Hypothesized Causal Sequence

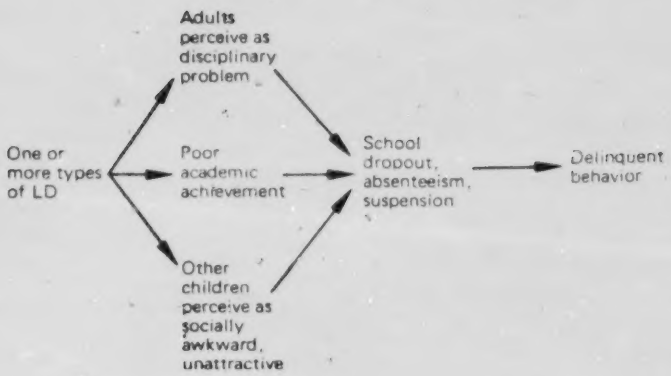
Discussions with proponents of the LD/JD link and a review of the literature reveal two routes by which LD is thought to produce delinquency.

The first of these is a familiar one which links LD to school failure, to dropout, and to delinquency--the "School Failure rationale," for convenience.

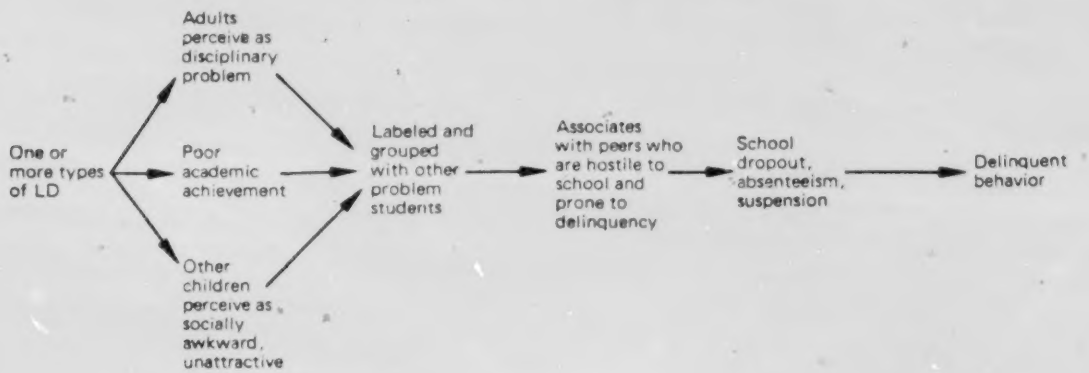
The most graphic description of it is found in this passage by Berman:

> The cycle begins with early problems at home. The child was showing perceptual and attention problems even prior to school, but the behavior was written off as "ornery" or "uncooperative" personality. The child enters the early grades of school already accustomed to the fact that he won't be able to do things as well as expected of him, that he will fail and be humiliated continually. This prophecy is fulfilled in school as teachers, considering the child "a behavior problem," punish and ridicule him for failures or for behaviors that he cannot control. The child begins to think of himself as a loser, as someone who can never hope to live up to what people expect of him.
>
> Rather than face the embarrassment of continual failure in front of friends and teachers, the behavioral signs become even more pronounced. Clowning around and general disruptiveness become the ways which best insulate this youngster from having to face continual and repeated failure. He becomes much more successful as a clown or troublemaker than he ever could be as a student.
>
> Teachers now are completely diverted away from any learning problems and concentrate solely on how to deal with the child's behavior. He gets further and further behind, becomes more and more of a problem. Eventually he's suspended, drops out or is thrown out of school to roam the streets, and the inevitable road to delinquency is well under way. The original problems have never been dealt with; the child is thought of as incorrigible. His problems are seen as psychogenic, not as the result of deflated self-esteem and fears of inadequacy, all of which have been generated by disability. His prophecy of himself as a loser has been fulfilled (Berman, 1975, pp. 45-46).

This rationale refers to three immediate effects on the learning disability (or set of disabilities): adults perceive the child as being a disciplinary problem; the child is inherently handicapped in achieving academically (apart from the effects of the self-fulfilling prophecy that Berman mentions); and his peers perceive him as socially awkward and generally unattractive except as an object of ridicule. Diagrammatically:


Adults perceive as disciplinary problem
One or more types of LD
Poor academic achievement
School dropout, absenteeism, suspension
Delinquent behavior
Other children perceive as socially awkward, unattractive

It is useful to further elaborate on the mechanism which is thought to be involved in the process leading to dropout; namely, the *labeling process*, whereby a student who has a prior record or who is a behavior problem (or both) tends to be labeled as a problem student. Perhaps he is informally labeled; perhaps he is grouped in classes with other problem students. As a result of labeling, it is argued, the child's negative self-image is reinforced by adults as well as by his peers; and, further, he is thrown into contact with other "problem" children, many of whom are likely to be considered problems *because* they are hostile to school and prone to engage in delinquency. The result is to encourage the LD child to be socialized by the children who are most likely to drop out or to become delinquent. The School Failure rationale now looks roughly like this:


Adults perceive as disciplinary problem
One or more types of LD
Poor academic achievement
Labeled and grouped with other problem students
Associates with peers who are hostile to school and prone to delinquency
School dropout, absenteeism, suspension
Delinquent behavior
Other children perceive as socially awkward, unattractive

Finally, it is important to specify the mechanisms hypothesized to produce delinquent behavior. These are least often made explicit, since the contribution of dropout to delinquency is often taken for granted. There appear to be two main mechanisms for that linkage. First, the dropout simply has more time on his hands -- as Elliott

and Voss put it (without endorsing it), "'idle hands are the devil's workshop' has been translated into a simple scientific proposition" (Elliott & Voss, 1974, p. 110). A second motive could plausibly be inferred from the dropout's lack of marketable skills--committing thefts is the most available way of making a living. And a separate sequence is added, which does not depend on dropout or school failure: the fact of continual failure itself is hypothesized to produce needs for compensation, which in turn increase the reinforcement value of acts which defy authority.

This rationale linking LD and delinquency is shown in figure 3.1 below. It is not a complete set of links--a full-scale rationale

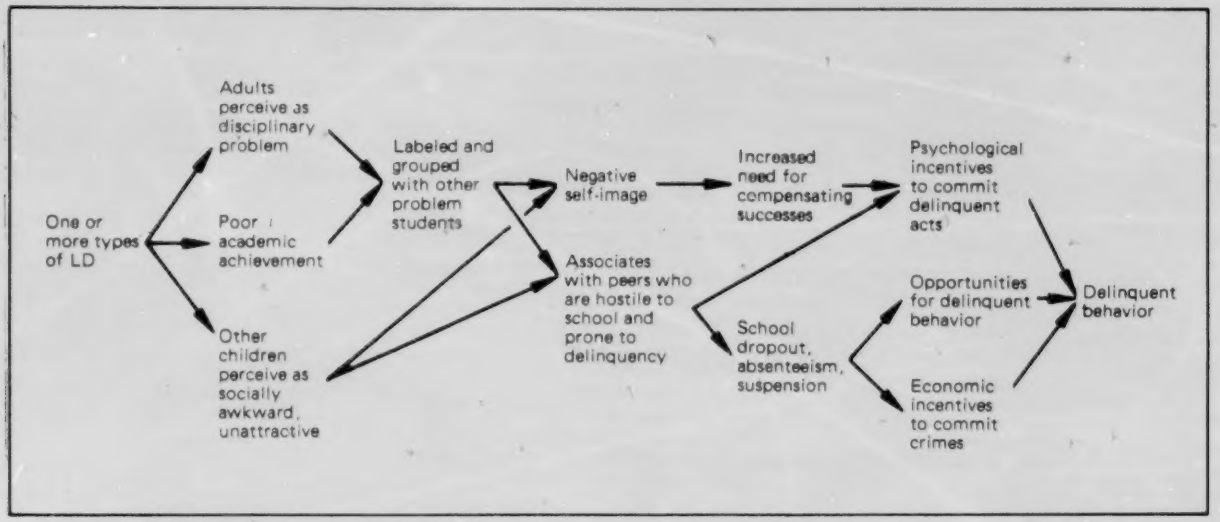

One or more types of LD
Adults perceive as disciplinary problem
Poor academic achievement
Other children perceive as socially awkward, unattractive
Labeled and grouped with other problem students
Negative self-image
Associates with peers who are hostile to school and prone to delinquency
Increased need for compensating successes
School dropout, absenteeism, suspension
Psychological incentives to commit delinquent acts
Opportunities for delinquent behavior
Economic incentives to commit crimes
Delinquent behavior

FIGURE 3.1

The School Failure Rationale Linking LD and Delinquency

would require variables and interactions and feedback loops of terrific complexity -- but it does set down the essential events of one common line of argument linking LD and delinquency.

The second line of argument linking LD and delinquency is briefer and much more direct, at least in taking the chain to the point of increased *susceptibility* to delinquent behavior. In effect, this rationale--call it the Susceptibility rationale--argues that certain types and combinations of LD are accompanied by a variety of socially troublesome personality characteristics. These go beyond the physical and social awkwardness which was discussed earlier. General impulsiveness is one of these characteristics: many LD children are said to be quicker than normal children to act on a sudden whim. Closely related to this is an apparent poor ability to learn from experience. The LD child is often said to have more than usual difficulty in accepting

(or absorbing) the probability that if an act was accompanied by unpleasant consequences the last time, it will be accompanied by them this time too. The third commonly discussed characteristic which fits into this rationale is poor reception of social cues. As one observer of LD children put it, "...he does not appreciate the 'weight' of what is said or the 'toughness' of social danger signs" (Peters, 1974, p. 2). He can back himself into a confrontation without knowing how he got there.

Together, characteristics like these point to a child who is said to be less than ordinarily sensitive to the usual social sanctions and rewards. The problem is not initially callousness or street toughness on the part of the child. He might, on the contrary, be extremely receptive to rewards and sanctions. But the messages do not get through in quite the way they were intended, with the result that some of the factors which might restrain a normal child from committing a delinquent act might not restrain the LD child. The Susceptibility rationale for linking LD to delinquency is, then, just that: a causal chain suggesting that *ceteris paribus*, the LD child starts out with a strike against him when exposed to opportunities for committing delinquent acts. The basic steps are recapitulated in figure 3.2 below.

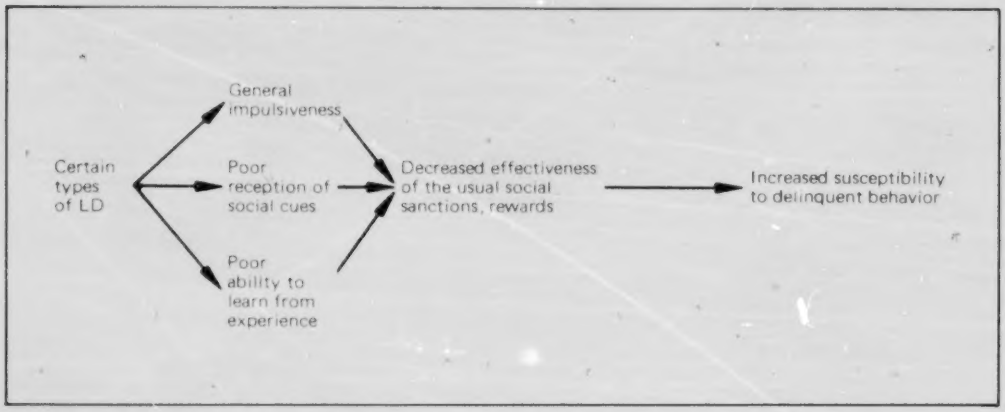

General impulsiveness
Certain types of LD
Poor reception of social cues
Decreased effectiveness of the usual social sanctions, rewards
Increased susceptibility to delinquent behavior
Poor ability to learn from experience

FIGURE 3.2

The Susceptibility Rationale Linking LD and Delinquency

The two chains of reasoning summarized above capture the major arguments used to link LD with delinquency. The ultimate test of the arguments is simple--at least in theory. If the link exists, a population of learning disabled children will show higher rates of "delinquency" (however defined) than a matched set of children who are not learning disabled. But such a test has not been conducted; and one is not likely to be completed in the near future. There are a number of very difficult obstacles. A major one is time: to test whether

LD *causes* delinquency, it is (among other things) essential to know that the LD exists prior to the delinquency. This implies the need to identify samples of LD and "normal" children at an early age, and to follow them through adolescence--the kind of longitudinal study that is so badly needed in so many aspects of the effort to understand and prevent delinquency. Lacking that, the evidence for and against the LD/JD link must take other forms. In the remainder of this section, we attempt to describe the overall state of the evidence.

B. The Case for a Link

With rare exception, the impetus for discussing LD as a cause of delinquency has originated not among the academic specialists on either delinquency or LD, but among practitioners: counselors for schools and juvenile courts, staffs in correctional facilities for juveniles, and clinical psychologists who work with disturbed youth.

In addition to reviewing the publications and conference papers of these persons, we talked with a number of them. The programs for which they work are described in more detail in Appendix A; briefly, these consultants included: Thomas James and staff members of the project he directs, "New Pride" in Denver, a community-based intensive supervision project for 60 delinquents who have two or more adjudications, and who also exhibit serious educational problems; Nancy Miles and Will Edwards of Denver's Project Intercept, a non-residential program for referrals from nearby schools--"problem students" who are thought to be on the road to serious delinquent offenses; Richard E. Compton, now director of juvenile social and rehabilitative services in Arkansas; Dr. Chester Poremba, Chief Psychologist of the Children's Hospital in Denver, formerly psychologist for a juvenile court and now one of the leading proponents of the LD/JD link; Dr. Allan Berman, formerly director of the Neuropsychology Laboratory and Diagnostic Clinic for the Rhode Island Training Schools; and five principal staff members--Dr. Steven Bloom, Dr. Helen Hursch, Dr. Charles Baccum, Richard Stuart, and Edward Mills--of the Colorado Division of Youth Services, which operates a leading program in specialized educational services for delinquents. [1]

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[1]As the list indicates, Colorado is a center of activity in this area. An additional consultant from Denver on the education of LD children (not delinquent) was Sister Elizabeth Thro, principal of what is widely considered to be one of the nation's leading schools for LD children, the Havern School.

The evidence which the proponents offer in support of the LD/JD link takes two forms: the observational evidence of these professionals who work with delinquents, and some quantitative studies.

1. *The Observational Record.* Of the two types, the observational data are at the same time less systematic and more persuasive. In effect, the counselors, correctional staff members, and psychologists whom we consulted were reporting case studies of the sequences of events we have outlined. The children they see in the course of their work *are* in the process of being labeled as problem children; they *are* experiencing school failures and contemporaneously committing delinquent acts; they *are* showing up in juvenile courts just following dropout from school. Moreover, these practitioners report that their client youth give self-reports of "reasons why" which fit the rationales: children who say that their sets of friends have changed because they are isolated by academic and social failure; who say they are dropping out of school because of failures; and who convey their sense of getting even with their school failures by committing delinquent acts.

That these observers are practitioners has also sometimes meant that they are not specially trained in observing and diagnosing learning problems or disabilities. But among the most active proponents of the LD/JD link have been some who do have the specialist's credentials. One, for example, began as a clinical psychologist specializing in treatment of children with known brain insult and inferred minimal brain damage. Subsequently, he was hired as a psychologist for a municipal juvenile court. As he relates it, "....my first year in the juvenile court was really a living hell. Because most of the kids I was seeing I was sure were like those kids whom we call minimally brain damaged.... I felt that I had some kind of hang-up on this, that I was seeing minimal brain damage in everybody" (Poremba, 1974, p. 3). He, like other psychologists with whom we talked, became convinced that his clinical judgment had not deserted him; that in fact he was observing minimal brain damage in an unusually high proportion of the delinquents he met. Other practitioners have come to the rationale from an educational or a legal specialty.

The common bond among them is a wealth of day-to-day personal experiences with delinquents and disturbed youth which exemplify the nodes outlined in the rationales. Throughout our interviews with them, it was apparent that they were able to give as many examples as we were prepared to hear.

There are a few examples of summarization of these kinds of observations, or ongoing attempts to summarize them. One of them is pragmatic observation of one senior staff member of a state correctional office that summer is a slack time for the intake and diagnostic

people. This may mean simply that surveillance and apprehension of delinquents is lower when school is in summer recess; but it is also plausible, and supportive of the School Failure rationale, that "inability to cope with school, whether academically or emotionally, increases a kid's chances of getting in trouble and getting committed" (Hursch, 1976).

Another source of information to support the causal argument is the retrospective analysis of school records. Compton argues that analysis of records of learning disabled children reveals that "In a generalization of all of these patterns, [grades] two through six, there are at least two significant items common to all--a sudden drop in achievement coupled with truancy" (Compton, 1974, pp. 50-51). The report was based on preliminary results, and detailed analysis of these patterns is not available; but there is clearly a potential means of investigation through school records of this sort.[1]

These examples of attempts to summarize the observational evidence also serve to illustrate the difficulties of the task. Much of the most provocative information is nearly intractable to systematic examination. Each account is a story in itself, about a single case, and to be persuasive it must be told in some detail. And if the professional who works with delinquents tries to summarize years of experience, he or she has to do it in subjective terms, regardless of the validity of the judgment. There is no way (that we can find) of doing justice in a summary report to the evidence accumulated by these observers.

The intractability of the anecdotal evidence to the formal requirements of "data" should not obscure its latent authority. The persons whom we interviewed had dealt with thousands of delinquents: a "sample size" and representation which, if it were applied to a systematic survey, would be formidable. On a practical level, this should add weight to the conclusions of many of the practitioners we interviewed. When, for example, a psychologist in a juvenile facility generalizes that there is a subgroup of delinquents which is different from the rest, in ways which indicate that learning disabilities are a primary variable, her description warrants attention no matter how difficult it is to convert her perception into a bundle of data suitable for quantitative assessment.

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[1]See Appendix C for a review of the Compton article. Note that the school records data as reported in the article cut both ways. The pattern is said to characterize only 5% of the second grade records of LD delinquents, 8% of third grade, 20% of fourth grade (combining two similar patterns), 25% of fifth grade, and 17% of sixth grade. These proportions do not in themselves appear to make a compelling case for LD as a cause of school failures, or for school failure as a cause of delinquency.

2. *The Quantitative Record.* If it is true that many experienced, perceptive observers report that the phenomena supporting an LD/JD link characterize large groups of delinquents, it is also true that other, equally experienced and perceptive observers believe that these phenomena are rare. This is not a new observation. In response to it, several studies of the LD/JD link have been conducted which purport to demonstrate that, statistically, an unusually high proportion of delinquents are learning disabled.[1] And the claims are increasing in speeches, at conferences, and in the press that these studies are proof of the LD/JD link; accusations are heard that the relationship is being "studied to death" rather than being made the target of practical programs.

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[1]From a research standpoint, measuring incidence of LD among delinquent populations is a poor second-best to the ideal test (pp. 29-30) of following the development of delinquency longitudinally among a pre-identified LD population. There are statistical reasons--*ex post facto* analyses must work around several statistical constraints which tend to decrease confidence in causal interpretations. There is the major, very practical consideration of accurate data collection: researchers can document what is happening in the present much more accurately than they can reconstruct what happened in the past. There is the objectivity problem: once one *knows* that the child is both LD and delinquent, it is a struggle to keep from selectively fixing on those data which support a link between the two phenomena. And finally, even ignoring these problems, the measurement of LD among an already-delinquent population and an "already-nondelinquent" population is measuring LD in the adolescent, not in the child who preceded him. Even with careful diagnosis, estimation of the incidence of LD prior to the occurrence of delinquency would tend to *falsely exclude* (1) all spontaneous remissions among children who once were LD, and (2) children who have learned to compensate for their LD. It would tend to *falsely include* (3) all children with minor perceptual deficits who are underachieving primarily for other reasons, and (4) some non-LD children whose long-term lack of exposure to schooling produces LD-like symptoms which did not exist in childhood. The degree of error introduced by these false-positive and false-negative diagnoses is unknown. But it can be concluded that there is high potential for mistaken estimates of childhood LD, when the diagnoses are based on testing of the children as adolescents. And to make matters even more confused, it is plausible that the false omissions and inclusions will vary systematically: on inspection of the four categories above, the best bet would appear to be that more false *exclusions* will be found among the non-delinquent population; more false *inclusions* among the delinquent population. Or in other words: the difference in LD incidence rates will look greater than it really was, falsely encouraging the conclusion that delinquents (cont'd.)

Because these quantitative studies loom so large in the dialogue about LD and delinquency, we have devoted the following section of the report and Appendix C to an extremely detailed examination of them. The overall conclusions about them are given at the outset of Section V, Conclusions and Recommendations. But for this overview of the case for the link, it should be stated frankly that the extensive examination we devote to the studies is out of proportion to their weight as evidence. If the topic were not the LD/JD link, but some less highly-charged research question, they would have been summarized in a few sentences: There have been a few reports, most of them using very small samples, most of them informally designed, which have tried to draw conclusions about LD among delinquents. The studies do generally support the notion that delinquents in institutions suffer widely from learning handicaps, ranging from retardation to ocular problems to emotional disturbance to perceptual-motor problems. A few of the more carefully designed studies offer solid it small-sample (N = 15, N = 46) evidence that there is a statistically significant difference between the incidence of perceptual and perceptual-motor deficits in a population of institutionalized delinquents and a population of secondary school students. This evidence is worth noting, and it warrants further exploration. It cannot be interpreted in terms of LD incidence among delinquents, nor for estimating difference of incidence between delinquents and nondelinquents. As evidence of LD's causal relationship to delinquency, it is much less provocative than the observational, qualitative accounts. Readers with special interests in the existing quantitative evidence may examine the basis for this assessment in Section IV and Appendix C.

Overall, the evidence which was cited in direct support of the rationales may be summarized as follows. It is abundant, particularly in describing the importance of learning handicaps in general, but it exists in a highly qualitative, anecdotal form. Some of it was provided by persons whose commitment to persuading us seemed stronger than their concern with a balanced report of their experiences. But most of it came from people who appeared to be perceptive observers with a rich practical knowledge of delinquents and delinquency. The quantitative evidence adds little to their observations.

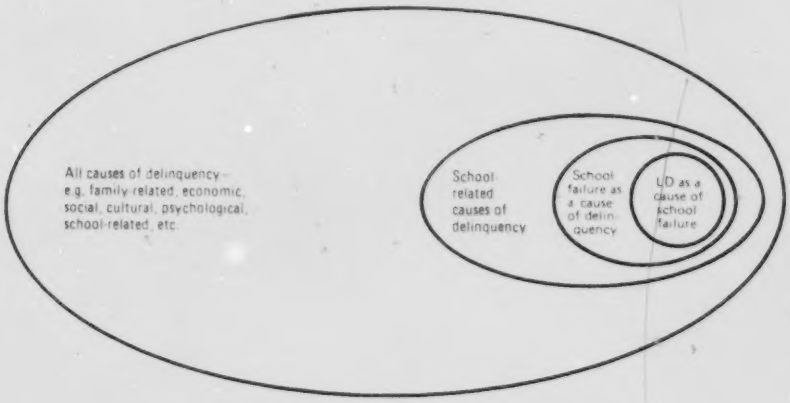
(fn cont'd.) more often suffer from LD than non-delinquents.

These issues are not raised in the critiques of the specific articles--we lack any way of estimating the degree of error they introduce. But it remains true that all of them begin with these crippling, inescapable constraints of *ex post facto* analysis against them.

C. The Case Against a Link

The proponents and opponents of the LD/JD link tended to break along practitioner/academician lines. This is not entirely accurate--many of the practitioners also hold teaching positions or perhaps conduct some research; many of the academicians work with youth in clinics and correctional facilities. But as a rule, it can be said that none of the leading proponents of the relationship comes from an academic background; and the academic consultants who specialize in delinquency were unanimously skeptical that a significant causal relationship exists. Their skepticism was based on two types of objection: *the general state of causal explanations* for delinquency, and some more *specific existing evidence* which casts doubt on some of the causal links between LD and delinquency.

1. *LD and Causal Explanations in General.* The single point of consensus was that the rationales for the link between LD and delinquency comprise one very small segment of a very large causal map. The diagrammed relationships shown in the School Failure rationale (Figure 3.1), for example, are nested within a series of larger causal networks. LD is only one of many causes of school


All causes of delinquency - e.g. family related, economic, social, cultural, psychological, school-related, etc.
School related causes of delinquency
School failure as a cause of delinquency
LD as a cause of school failure

failure; school failure is only one of the many ways in which the school experience might cause delinquency; and the school is only one of many settings in which delinquency is thought to be nurtured. A parallel illustration could be drawn about the Susceptibility rationale: LD is only one of many sources of the psychological attributes said to increase susceptibility to delinquency; this set of attributes is only one of many psychological configurations which can conduce to delinquency; and psychological attributes are only one of many other factors which contribute to delinquent behavior.

These "other factors," it was frequently emphasized, are of major and documented importance. Given what is already known about the importance of poverty, the broken home, social disadvantagement, cultural alienation, emotional disorders, socialization by delinquent peers, or any of a number of other variables, the argument that LD is a primary cause of a major part of the delinquency problem is extremely dubious on its face--we are accumulating more "primary causes" than the number of delinquents will bear.

To get around this objection, it was argued, the proponents of the LD/JD link are driven toward one of two alternatives. The first is to argue that LD can be a critical *catalyst* of delinquent behavior, interacting with other potential causes. The second alternative is to argue that the socioeconomic factors which are said to cause delinquency actually cause LD, which in turn causes the delinquency. Either alternative produces the same question: how much of the variance can be attributed to the causal influence of the LD? Or less formally, to what extent are LD and delinquency symptoms of the same disease? Even if it is assumed for the sake of argument that (for example) pre-school environmental disadvantages can cause genuine LD, and that LD can increase the likelihood of delinquency, it is also an odds-on bet that the same home is having many other deleterious effects on the child. So, it was asked, even if the child is treated for his learning disability, how much difference will it make?

Variations on this argument were common among the specialists on delinquency, cutting across theoretical schools of thought. It reduced to a single theme: the notion that a significant proportion of delinquent behavior can be *causally* explained by a single variable, LD, goes against the grain of the scholarship on delinquency. One of the few things known for sure about delinquency is that its causes are multivariate and complex.

2. *The Rationales and Existing Evidence.* In general, the many explanations for delinquency and their supporting data do not either contradict or confirm the causal logic linking LD with delinquency. They simply do not intersect. But there are aspects of delinquency research which are relevant. They are summarized below, for each of the rationales.

a. *The School Failure Rationale.* Most specialists in delinquency must keep in touch with educational developments as well; similarly, most specialists in the education of exceptional children deal with issues relating to delinquents and predelinquents. So nearly all of the consultants, whether they came from a delinquency or education specialty, had things to say about the school/delinquency relationship. Among the consultants were, however, some who had dealt directly with that relationship in their work. Among the delinquency experts, these included Delbert S. Elliott (*Delinquency and Dropout*), William Kvaraceus (*Juvenile Delinquency and the*

School and *Anxious Youth: Dynamics of Delinquency*), and Kenneth Polk (*Schools and Delinquency*, with W. Schafer).[1] Among the learning and education specialists who had also done work specifically on delinquency were Ralph Rabinovitch ("Juvenile Delinquency: Consideration of Etiology and Treatment"), and Margaret and Norman Silberberg ("School Achievement and Delinquency").

The association between school failure and delinquency. On one point underlying the School Failure rationale there was no argument: delinquents characteristically do have poor school records. This relationship was one of the first to be documented in the study of delinquency and it has been observed repeatedly.[2] A recent example, by no means the most dramatic one, is the finding in the Philadelphia cohort study that more than half (54.6%) of the delinquent boys were below average in school achievement, compared to only 27.4% of the non-delinquent boys (Wolfgang et al., 1972, p. 63). The *association* between poor school performance and delinquency was not disputed by any of the consultants. But there was no consensus on the strength of the *causal* relationship.

Direct critique of the causal linkages. By far the most direct critical commentary on the logic of the School Failure rationale is found in a study by a British specialist on learning disabilities, E.M.R. Critchley (See Critchley, 1968).[3] Using demanding operational definitions of reading retardation and dyslexia, the author analyzed the records of 371 institutionalized delinquent boys. The interpretation of his findings is obscured by his inclusion of dyslexic boys with the much larger sample of reading retarded,[4] and his findings are by no means "definitive." But he does appear to stay well within his data when he concludes as follows:

> In the past, many have speculated upon a causal connection between reading retardation, truancy, and delinquency,...but few people have attempted an investigation of this linkage. The present attempt...including (i) examination of the aetiology of reading disability

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[1] See Appendix A for citations of these and other publications of the consultants.

[2] See Silberberg and Silberberg (1971) for a concise review of the literature on school achievement and delinquency.

[3] As indicated in the technical critique in Appendix C, Critchley gets high marks for technical care--on the same order as Hurwitz et al. (1972) and the first section of Berman (1975), which present evidence supportive of a statistical association between perceptual deficits and delinquency.

[4] Though his definition of "dyslexia" was so stringent that, as he points out, "it may have been that the number of developmental dyslexics in the sample was seriously underestimated" (p. 1545).

> as seen among delinquent children, (ii) review of the emotional and scholastic background of the retarded readers and comparison of their background with that of other delinquents not retarded in reading, and (iii) scrutiny of the life-history of the more intelligent of the retarded readers to trace the relationship between early schooling, disruptive events and behavioural disorders, did not reveal the manner whereby a dyslexic child may drift into delinquency. (Critchley, 1968, p. 1546)

With this exception, the studies which directly address the LD/JD link have concluded that their data supported its existence. Criticism of the linkages comes from more indirect sources.

The effects of labeling. An important part of the School Failure logic is that LD children are mistakenly "labeled" as slow learners or behavior problems, which sets up a destructive cycle whereby the child does in fact become a behavior problem or a failure in school. Consultant opinion on this topic diverged widely.

Some consultants were convinced that labeling's causal role is substantial and proven: children do tend to become what they are told they are. The more powerful the labeling ritual (e.g., the process of becoming an adjudicated delinquent), the more powerful the effects. Within the school, being labeled "dumb" by peers or a "slow learner" by adults might produce less dramatic immediate effects than being labeled "delinquent," but it does escalate the frustration which can motivate delinquent behavior. By the same logic, being labeled "LD" can have its own debilitating effects on a child's development. At this point in the argument, opinion divided radically. Some consultants criticized the labels as being artificial and harmful props of our educational system, and stressed the need for fundamental reform. Others adopted a more limited stance, criticizing inaccurate labeling rather than the process itself, or criticizing failure to follow up the label with remedial programs.

Others had reached generally skeptical conclusions about the causal role of labeling. One source of skepticism was the many logical problems of demonstrating the relationship. To the extent that labeling reflects reality, it will in fact *predict* certain behaviors. The temporal sequence--labeling, followed by predicted result--has a spuriously causal appearance. Other skepticism was expressed about the plausibility of the argument. Children are labeled in dozens of ways simultaneously, with labels of mixed valence: the class brain who is clumsy at athletics; the star athlete who barely

passes his courses; the able underachiever in the classroom who is a social leader among his peers. Neither the socialization nor the psychological development of the child is likely to be governed by any one label. And finally, the most general source of skepticism was the state of the data. A number of studies have attempted to demonstrate the effects of labeling; there appeared to be widespread dissatisfaction with the quality of them.

School dropout and delinquency. Proponents of LD's causal role repeatedly portray dropout as a key event bridging LD and delinquency, and it would appear to be one of the most obvious, least arguable links in the chain. But there is increasing doubt that the "obvious" causal role of dropout actually exists. A recent and major longitudinal study of dropout and delinquency (Elliott and Voss, 1974) raises serious doubts about the extent to which dropout contributes to delinquency. Elliott and Voss, like others before them, found that dropouts have much higher rates of official and self-reported delinquency than non-dropouts. But the longitudinal analysis reveals that the highest rates occurred *prior* to dropping out of school. Once they were no longer in school, "the findings based on the two measures of delinquency [police records and self-reported delinquency] are consistent--there is decreasing involvement in delinquency after dropout" (Elliott & Voss, 1974, p. 119). This is not a decisive criticism of the School Failure rationale--the essential event is school failure; dropout is only one alternative route to subsequent delinquency. But this can be viewed in light of the additional finding that "educationally handicapped" dropouts had only slightly, non-significantly higher mean delinquency rates than "intellectually capable" dropouts (Elliott & Voss, 1974, p. 115). Put conservatively, these findings, using a large, multi-school sample and what appears to be a carefully executed methodology, are at least not supportive of arguments for the disability → failure → delinquency chain as a dominant source of delinquency.

Much the same conclusion could serve as a summary about the relationship of the existing theory and data to the School Failure rationale: They are not supportive of a major role for LD as a cause of school failure leading then to delinquency; neither do they eliminate the possibility that LD plays this major role.

b. *The Susceptibility Rationale*. The consultants who deal with LD children emphasized how ordinary these children are in general personality, when the disabilities are mild. The milder the disability, the more the LD child is indistinguishable from his non-LD peers. And by the same logic, the milder the disability, the less likely that it is a cause of subsequent delinquency. But many of those who argue for a closer look at the LD/JD link did so out of observation of a personality type characteristic of the severely learning disabled child who has reached early adolescence without diagnosis or treatment. A constellation of personality traits is said to be at work: impulsiveness, poor receptivity of social cues, and poor ability to learn from

experience. The pattern of traits was summarized in various ways. The most evocative was provided by Dr. Helen Hursch, a supervisor of diagnostic services in the Colorado system. "I think of them as large pre-schoolers," she said of the residents in a cottage set aside for delinquents diagnosed as severely learning disabled; and that conveys the overall image suggested by other sources: of LD delinquents who are not essentially hostile, who often try hard to please without being sure how to do it, who are impulsive in childlike ways; generally immature; often very dependent. The question asked here is: to what extent have these traits been found to characterize delinquents as a group?

Classification of delinquents. One source of information on this issue is the results of personality classification programs which have been applied operationally by juvenile corrections services. The most widely used of these is the "Interpersonal Maturity Level Classification" system first developed in the 1950's (see Sullivan, Grant, & Grant, 1957) and since expanded and applied in California, New York, and many other states. The system defines seven successive stages of interpersonal maturity, ranging from the level of a newborn infant to that of a socially mature adult. For all practical purposes, levels 2 through 4 have been found to include almost all juvenile delinquents who have undergone the classification process. A total of nine delinquent subtypes have been defined within those three levels.

Which of these levels include the severely disabled child who is characterized in the Susceptibility rationale? Two were proposed. One was the "I-2" level, applied to a child whose interpersonal standing and behavior are integrated in ways that conceive and react to others primarily as "givers" or "withholders." He has no conception of interpersonal refinement beyond this. He is unable to explain, understand, or predict the behavior or reactions of others. The child is not interested in things outside himself except as a source of supply. He behaves impulsively, unaware of the effects of his behavior on others. Since the child is a simple perceiver, "a receiver of life's impact," and has difficulty understanding structure, he has many problems in school, and typically needs small classes and specially trained teachers (Warren et al., 1966). According to Marguerite Q. Warren, who was one of the leading figures in the development of the system, extensive classification experience in California and New York indicates that only about five percent of all delinquents fall in the I-2 classification.

A second level in which LD delinquents tend to cluster was argued to be "I-3 cfm," the "immature conformist." This child may generally be described as immature, dependent, extremely eager for social approval, and with low self-esteem. About 26% of juvenile delinquents in New York are classified as I-3 cfm. Referring

specifically to institutionalized delinquents, Hursch estimates that I-3 cfm's constitute half to two-thirds of the intake for Colorado.

Neither of these groups should be seen as learning disabled by another name. It is argued simply that those delinquents who *are* severely LD tend to cluster within them. The problem is estimating the proportions. Warren (who disclaimed expertise in LD *per se*) speculates that most LD would fall in I-2. And on a more general level, her experience with classification results of the Interpersonal Maturity system and other systems left her very skeptical that LD can explain much of the variance in delinquency.

Another view was posed by Hursch. In her experience, the I-3 cfm group contains the bulk of the LD delinquents; specifically, "the 'low' end, in the interpersonal sense, are my 'large preschoolers'.... The extreme high end of the group usually, like the I-4's, are not LD, [while those in] the low end almost all are either retarded or LD." She describes the relevant symptoms as follows: "The most important area of difficulty usually is language. They have auditory reception problems (difficulty distinguishing the stimuli to which they are trying to attend from the background noise), sequencing, memory span, discrimination, etc., poor inner language to use in thinking, difficulty retrieving words and facts they obviously know, plus small vocabularies and confused grammar...." (Hursch, 1976).

Whether the results of the experiences in classifying delinquents are inconsistent with the logic of the Susceptibility chain depends very much on the assumptions which are chosen. If the subset of LD children within the I-2 and I-3 cfm levels is assumed to be large, a nontrivial overall proportion of LD delinquents can be inferred. If the subset is assumed to be small, some very modest overall proportion of LD "susceptible" delinquents is implied. In either case, however, it appears most reasonable to assume that a clear minority of the total delinquent population is involved.

Personality Characteristics. One of the consultants for the study, Herbert C. Quay, has been for some years one of the leading scholars in the study of personality characteristics of delinquents. Quay has also done substantial work directly on the issues of perceptual characteristics of delinquents, without explicitly using "LD" as a construct.

Quay approached the topic of delinquent personality from a quantitative and behavioral perspective, asking this question: can the deviant behaviors of children and adolescents be grouped into a few basic syndromes that are 1) *internally consistent* (if a child exhibits behaviors A, B, and C, chances are high that he will also exhibit behavior D), 2) *independent* (mixes of behavior across syndromes are limited), 3) *replicable* (the same patterns are found to occur across a variety of youth populations, 4) *valid* (the same patterns persist across measurement procedures, and 5) *inclusive* (the syndromes effectively encompass the universe of deviant behaviors in children). His synthesis of the literature and several studies of his own, lead him to the conclusion that these conditions can be met by use of only four syndromes, labeled "conduct disorder," "personality disorder," "immaturity," and "socialized delinquency" (Quay, 1972).

The relevance of this to the LD/JD issue parallels the relevance of the Interpersonal Maturity system: one of the syndromes--immaturity--roughly corresponds to the personality characteristics which are often ascribed to severely learning disabled children. Among the most common behavior traits in the immaturity subgroup have been preoccupation, short attention span, and clumsiness; in the life histories of children in this classification, key characteristics cited by Quay are truancy from home and inability to cope with complex world. Again, it must be emphasized that the immaturity syndrome does not coincide with the characteristics of the severely learning disabled; it is an imperfect superset which plausibly encompasses most of the severely LD children, plus many others who exhibit correlate personality traits without suffering from the learning disability. Quay's summary is worth quoting at length:

> Although the third major pattern [immaturity] has not been as pervasive and prominent as the previous two patterns, it has nevertheless appeared in a number of studies.... As with conduct and personality disorder, immaturity has been found in samples of children and adolescent studies in public schools, child-guidance clinics, and institutions for the delinquent.... With the notable exception of a study of emotionally disturbed children in special classes,...it is generally less prominent than either conduct disorder or personality disorder.... Since most of the behaviors [in the immaturity pattern] seem appropriate to all children at some state in their development, this pattern seems to represent a persistence of these behaviors when they are inappropriate to the chronological age of the child and society's expectations of him. At the same time, regression to an earlier form of behavior could also be involved. Again, this pattern occurs in all settings where deviant children are found. It seems especially prominent in public school classes for the emotionally disturbed ... and the learning disabled.... (Quay, 1972)

The point to emphasize is that the set of delinquents characterized by the behaviors of the "immaturity" pattern has consistently accounted for a smaller proportion of delinquents than any of the other three patterns; presumably, the severely LD are only a portion of even that population. Quay's impromptu estimate (not to be confused with the quantitative evidence just cited) of the proportion of the delinquents who were learning disabled in the sense of "a clearly demonstrable perceptual or integrative disorder" was very small--less than one percent.

Many other personality classification schemes have been employed for describing delinquents. They have broad overlap--a 1966 NIMH conference on typologies attended by the progenitors of most of the major ones was able to reach substantial consensus on commonalities (Warren, 1971, p. 249). And in most of them, there is a category which roughly corresponds to the configuration suggested by the Susceptibility rationale. A delinquent subtype exists which shares many of the personality characteristics of the learning disabled. But the evidence in the literature on personality and delinquency suggests that this subtype comprises a minority, perhaps a small minority, of the overall delinquent population. This does not argue decisively against the School Failure rationale, whereby academic failures alone could be the critical trigger regardless of personality characteristics. But the Susceptibility rationale does hinge on personality traits. The evidence on the delinquent personality cited above does raise a number of doubts about how widely the rationale can be applied to explain delinquency.

IV. THE QUANTITATIVE EVIDENCE

> The close link between learning disabilities and delinquency is coming into focus. That delinquents preponderantly exhibit learning disabilities has been made clear,... (Poremba, 1975, p. 146)

> With such research as this--and we have not endeavored to list nearly all of it--*the question can no longer be* "Is there a relationship between cerebral dysfunction and juvenile delinquency?", but, rather, "How can this disability be treated, and, ultimately, prevented to help our troubled youth and reduce crime?" (Wacker, 1974, p. II-5)

> "Learning Disabilities and Juvenile Delinquency: A Demonstrated Relationship." (title of an article by Jacobson [1974])

During the past seven years, several studies have sought to measure the incidence of LD among delinquent populations. Many of them have reported startlingly high proportions. Half, three-quarters, even 90 percent of the members of the delinquent samples have been diagnosed as suffering from one or more learning disabilities. And, as the introductory quotations indicate, one school of thought holds that the evidence has already demonstrated the basic relationship.

The examination of the statistical evidence is the subject of this section. For an overall, nontechnical appraisal, see page 32 and Section V.

A. A Note on the General Approach to Proof

The following is a technical critique. It deals with problems of operational definition, sample selection, tests, procedures, and data analysis. The value of the final results are often discounted because of defects in these areas; failures which sometimes may seem minor at first glance. Given this approach, it may

rightly be asked whether methodological hair-splitting is obstructing the effort to appraise the overall sense of the data. What is, finally, "enough" evidence? Since this appraisal has been based on certain points of view about the meaning of enough, it is appropriate to state them explicitly.

The first assumption is that in reaching program decisions, *an agency like OJJDP should not as a matter of course demand the same standards of proof that are applied by the scientific community.* If program decisions have to wait for a precise calibration of what kinds of learning disability lead to what kinds of delinquency under what circumstances, nothing is going to be done for years, if ever. A rougher determination has to be made: based on the evidence at hand and the problem that has to be addressed, what is a reasonable use of tax dollars? Often, the issues are such that hard data cannot be obtained, and decisions to go ahead must be based on qualitative or ambiguous evidence.

But the argument for the LD/JD link has embedded in it a straightforward statement of statistical association: delinquent behavior occurs among LD children more often than would be expected by chance. This is a statement which can be rigorously tested with methods already at hand. Its truth is a necessary condition for sustaining the argument that LD causes delinquency. So in this case it seems not only reasonable but essential to take a hard look at the statistical evidence. In doing so, we apply a second assumption:

When one of the critical variables (LD) has no objective operational definition and no objective metrics for measuring the degree of its presence or absence, the technical aspects of instrumentation, testing procedures, and data analysis become critical factors in assessing not just the precision of conclusions, but whether they mean anything at all.

Assessing incidence of LD among delinquents is a fundamentally different research problem than, say, assessing incidence of myopia or hearing loss. Questions that can be trivial for some other types of associational research take on central importance.

Operational definition offers an excellent illustration. One of the studies which will be discussed in this section found that 90.4% of the delinquents examined were learning disabled. There was no control group, but on the face of it there are good reasons for asking why one would be needed: nobody argues that 90% of non-delinquent children--or any figure approaching it--are learning disabled. And even supposing that as many as a third of the diagnoses were false-positives, that would still leave more than half of the delinquents "genuinely" LD--a very large proportion. In short,

the initial reported incidence is so high that apparently no amount of haggling over methodology will lower the percentage to a point that there is any question whether delinquents are disproportionately learning disabled.

But the meaning of "90.4%" changes radically when one notes the author's statement that "our philosophy [is] that a learning disability or dysfunction is *anything which prevents a child from achieving successfully in a normal educational setting*," including sociological and psychological "dysfunctions" and (apparently) visual and hearing handicaps (Compton, 1974, p. 49. Emphasis added). The interpretation of "90.4%" becomes further confused when it is realized that it includes learning disabilities which were classified as "mild." How mild can LD be and still be a plausible cause of the delinquency?

For purposes of this study, these problems of operational definition make "90.4%" an uninterpretable number. For it is entirely compatible to accept as fact that (a) 90.4% of children whose behavior problems are so great that they have to be institutionalized also have some sort of learning difficulty; and that (b) this is not a relevant datum in assessing the proportion of those youth who have significantly disabling perceptual or integrative disorders. The issue is not one of methodological nuance, but a basic problem of using one label for two very different constructs.

Much the same introductory comments could be made about the importance of examining the *diagnostic tests*, in terms of both their content and their intended uses. A "good test" is a valid, reliable instrument for measuring what it is supposed to measure. When the thing-to-be-measured is an uncomplicated construct like spelling ability, a statement that the subject has a spelling problem because he did poorly on the spelling test has a common-sense meaning. As the thing-to-be-measured becomes less concrete, the test must measure a construct *which is defined by the test itself*--exemplified by the famous dictum that intelligence is that which is measured by an IQ test. When, as in the case of LD, there are no tests for which LD is the construct, it is mandatory that the diagnostic procedures be subjected to special scrutiny: the diagnostician is not working with self-evident test results, but with results which he then *infers* to be evidence that the subject is learning disabled. Thus, any statement to the effect that the subjects were administered tests A, B, and C, and that the results showed that X percent of the subjects were learning disabled has to be seen as a red flag: what are those tests, and what are they intended to test for? Again, this is not a technical issue, such as arguing the relative merits

of the Wechsler or the Stanford-Binet IQ tests. It is a variation on the Fallacy of the Tool which occurs chronically in quantitative social science: use of the wrong tools, because they are the only ones available.[1] An "abnormal" score on a test is evidence for the LD/JD association only if the test measures constructs related to perceptual or integrative disorders.

Finally, *testing procedures and analytic techniques* take on added importance when the topic is LD. Given that a substantial portion of personal judgment is inescapable in arriving at a diagnosis of LD--LD consultants of all schools agreed on this point--the question is also inescapable: has the researcher protected himself from the consequences of his own biases? This is not an indictment of the integrity of the researchers whose work we shall be reviewing. Arriving at consistent, unbiased judgments is much more complicated than simply being honest. Every researcher who has tried to apply a qualitative rating scheme over a large number of cases is familiar with the subtle ways in which judgments can be skewed, despite the most conscientious efforts to apply the same criteria to each case. When the topics under investigation are as highly charged as those of learning disabilities and juvenile delinquency, the potential for distortions is multiplied, and procedural precautions become correspondingly more significant.

B. The State of the Evidence

With the above remarks in mind, we turn to the review of the available evidence. Three types are examined: (1) evidence of *simple association* between the conditions of being delinquent and learning disabled; (2) evidence specifying the *magnitude of the difference* in LD incidence among delinquents and non-delinquent populations; and (3) evidence of *incidence of LD among delinquents*, without reference to a non-delinquent group.

Category I: Simple Association *(Do delinquents and non-delinquents show significant differences on tests for learning disabilities?)*

Summary: The evidence is limited and equivocal, but the existence of a difference is supported.

Discussion: Despite all the studies comparing delinquent and non-delinquent children, very few have compared both populations on

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[1]Fallacy of the Tool: "Given a hammer, everything else must be a nail."

perceptual and integrative deficits.[1] We found only two: Berman's (1975) unpublished article, "A neuropsychological approach to the etiology, prevention, and treatment of juvenile delinquency" and an article entitled "Neuropsychological function of normal boys, delinquent boys, and boys with learning problems," coauthored by Hurwitz, Bibace, Wolff, and Rowbotham (1972).

A technical appraisal of each is given in Appendix C. Briefly, the Berman study compared 45 boys in the Rhode Island Training School with 45 non-delinquent boys in an inner-city Providence secondary school adapting the Halstead-Reitan battery of tests which is customarily used to test for organic brain damage. The Hurwitz group conducted two separate small sample studies (both reported in the same 1972 article). One compared 15 delinquent boys in a training school, 15 in a school for learning disabled children, and 15 public school students on a test of motor development. The second, with delinquent and non-delinquent samples of 13, sought to build on a hypothesis suggested by the first study, by administering tests which would discriminate "sequencing" or "temporal" skills from "spatial" or "non-sequencing" skills.

A summary of our assessment is that *both studies are valid tests of whether a clinical sample and a normal sample differed on the tests being administered.* That is, we are satisfied that differences in scores cannot readily be attributed to incomparabilities in testing conditions and procedures or to experimenter bias, and that the statistical tests of significance were appropriate for the data.

Interpretation of the test scores poses a different problem. In one case (Hurwitz et al., 1972), the author's interpretations appears to be an extremely precise reflection of the data. In the other case (Berman, 1975), the interpretation is more speculative, and the test results admit of other explanations.

The summary conclusions of the Hurwitz study are that

- the delinquent sample was "significantly retarded on a broad spectrum test of motor development;"

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[1]We do not discuss the literature comparing delinquents and non-delinquents on the 14-6 cps positive EEG strike pattern and psychomotor seizure. Such comparisons are clearly relevant to the broader issue of neurological bases of delinquent behavior; but there was agreement among the specialists we consulted that these topics should not be confused with LD phenomena, etiologically or in terms of their relationship to delinquency.

- the delinquent sample "had specific difficulties in tasks demanding the sequential ordering of sensorimotor and verbal elements;" and

- overall, "the neuropsychological deficits of delinquent boys and boys with learning disabilities are manifested more clearly in tasks of temporal sequencing than in tasks of perceptual restructuring" (Hurwitz et al., 1972, p. 392).

The summary conclusions of the Berman study are that

- the delinquent sample was *not* retarded in "motor skills, attentional abilities, and gross sensory functioning"; and

- the deficits of the delinquent sample were found in "verbal, perceptual, and non-verbal conceptual spheres" (Berman, 1975, p. 40).

Converting these findings into statements about learning disabilities is difficult. Eighteen separate tests (plus general intelligence tests) were administered to the boys in the studies. Their terminology overlaps without being synonymous, and the constructs tested overlap without being identical. A starting point, however, is an inventory of the individual tests and the comparison of delinquent/non-delinquent performance, as shown in Table 4.1 on the following page.

It will be remembered that the critical features of LD as we are operationally using that term are:

- general I.Q. of "normal" or better (≥ 80),

- distinguishable from emotional disturbance or physical handicaps (e.g., poor hearing),

- not *directly* attributable to environmental disadvantage,

- existence of deficits in academic achievement relative to ability, and

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[1]One of our few criticisms of the Hurwitz discussion is the inclusion of "boys with learning disabilities" in their conclusion. The sample of LD boys was not reported to have been given the second set of tests, which included the tasks of perceptual restructuring. A more appropriate, limited, conclusion would appear to be that the motor development deficits of the LD boys were predominantly ones which required competence in rhythmical repetition; and that no data were obtained about their perceptual restructuring abilities.

TABLE 4.1
Summary of LD-Related Test Results Comparing Delinquent and Control Samples

	Primary Modalities	Test	Study	Findings: Better Mean Score	Findings: Significant difference?	Findings: P ≤
MOTOR	Gross and fine motor development: repetitive tasks	Six items of the Lincoln-Oseretsky Test	Hurwitz	control	yes	.01
	Fine motor development	Halstead-Reitan Finger Oscillation Test	Berman	delinquent	no	
	Sensorimotor rhythm (variability of peak-to-peak)	Tapping tests	Hurwitz	control	yes	.01
	Gross and fine motor development: non-repetitive	27 items of the Lincoln-Oseretsky Test	Hurwitz	control	no	
AUDITORY	Auditory discrimination	Rhythm subtest of the Seashore Test of Musical Talent	Berman	≅	no	
VISUAL	Visual discrimination of colors (repetitive)	Three subtests of the Stroop Test	Hurwitz	control	yes	.01, .05, .05
	Visual discrimination of objects (repetitive)	Naming repeated objects	Hurwitz	control	yes	.05
	Perceptual discrimination of embedded figures	Children's Embedded-Figures Test	Hurwitz	control	no	
VISUAL-MOTOR	Visual-motor integration	Beery-Buktenica visual-motor Integration Test	Hurwitz	≅	no	
	Visual-motor integration, memory	Graham-Kendall Memory-for-Designs Test	Hurwitz	control	no	
	Visual-motor integration (spatial organization)	Reitan Trailmaking Test, Parts A and B	Berman	control	yes	.01, .001
VISUAL-AUDITORY	Auditory-visual integration	Halstead-Reitan Speech Sounds Perception Test	Berman	control	yes	.05
TACTILE-OTHER	Tactile discrimination, fine motor development	Halstead-Reitan Tactual Performance Test: Time	Berman	control	yes	.05
	Tactile-visual integration, fine motor	Halstead-Reitan Tactual Performance Test: Memory	Berman	control	yes	.01
	Tactile-visualization of spatial configurations	Halstead-Reitan Tactual Performance Test: Localization	Berman	control	yes	.01
GENERAL	Sensory-perceptual disturbances	Six subtests of Reitan Sensory-Perceptual Disturbances Test	Berman	≅	no	
	Spatial relationships	Standard Raven Progressive Matrices	Hurwitz	control	no	
	Concept formation	Halstead-Reitan Categories Test	Berman	control	yes	.001

• evidence of perceptual or perceptual-motor disorder.

We shall examine the studies in terms of each of these stipulations.

1. *Can the results be explained by deficits of general intelligence?*

Our judgment is that *the Hurwitz results as reported are not explainable by deficits of general intelligence* among the Ss.[1] In absolute terms, all of the boys in Study I (motor development) were in the normal range (mean IQ, 101; range, 96-117; S.D. 22.5).[2] All but an estimated 2 of the 13 boys in Study II (temporal and spatial tasks) were in the normal range (our interpolation from the reported mean IQ of 96 with a range from 73 to 108 and an S.D. of 14.8). In Study I, between-group IQ differences were not significant. In Study II, group IQ differences were significant at the .05 level, but "the correlation between IQs and spatial and temporal tasks within each population was not significant...." (Hurwitz 1972, p. 392)[3] More to the point, an analysis of covariance with intelligence as the control factor was carried out, and it showed that for only one test (the Raven Matrices Test) did IQ differences contribute to observed differences between the means of the two groups--and still the difference was not statistically significant.

In contrast, *it appears that for the Berman study, general intelligence could account for some of the between-group differences.* The analyses which could resolve this question have not yet been carried out. These observations seem pertinent: The mean full-scale IQ (WAIS) of the delinquent sample was only 90.6. This is lower than the mean for other surveys of delinquents in training schools, and raises the possibility that Berman had to work with a sample of boys with unusually low intelligence. Also, the standard deviation was 11.4, which, with the assumption of a normal distribution, suggests that roughly eight out of the 45 delinquents were below the 80-point score often used to demarcate the bottom edge of the normal range. And finally, the difference between the means of the delinquent and control samples was 12.5 points, significant at the .001 level. As an absolute difference, it is less than those reported in the two sets of Hurwitz samples; but two factors make the problem an acute one for interpreting the Berman findings.

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[1] "S" is a widely used convention which denotes "subject of the experiment in question."

[2] One of these parameters is incorrect. An S.D. of 22.5 cannot be produced by a sample with the mean, range, and n as given.

[3] Nonetheless, the absence of inter-test correlation matrices in both the Hurwitz and Berman studies created a number of problems in assessing the significance and stability of the results.

First, failure to take lower delinquent IQ into account would have tended to falsely *disconfirm* the Hurwitz argument that neuropsychological deficits among delinquents divide along the temporal/spatial dimensions. The influence of general intelligence differences would have been to obscure evidence for the Hurwitz study's explanation, not to enhance it. In contrast, *the failure to take lower delinquent IQ into account could tend to falsely confirm the Berman study's argument* that delinquents suffer from an impoverishment of neuropsychological adaptive abilities which is negligible for the less complex abilities and progressively more severe for more complex abilities. A rival hypothesis appears to be equally consistent with the data, that the delinquents' scores differ from a control group's in proportion to the test's correlation with the WAIS results. Conceptually, Berman's use of "complex adaptive abilities" is difficult to distinguish from a descriptor of general intelligence.

The second reason why the IQ difference confounds interpretation of the Berman study and not the Hurwitz study is, of course, that the Hurwitz study tested for its relevance while the Berman study did not. It *may be* that the IQ influence can legitimately be discounted in the Berman study, but the analyses necessary to demonstrate that were not performed.[1]

On the other side of the argument, studies applying the Halstead-Reitan battery indicate that, with the exception of the Category Test, the test scores are not substantially correlated with IQ scores. Insofar as this independence may have held true for Berman's sample, the importance of differences in IQ are diminished.

2. *Can the results be explained by emotional disturbance or physical handicaps?*

The Hurwitz study used as a criterion of selection that no Ss suffer from major neurological or other organic illnesses, or from obvious psychotic symptoms. Berman's article does not specify procedures on this point. Berman reports that standard admissions tests did not reveal obvious physical or emotional handicaps (Berman, 1976).

Berman took his control group from the same inner-city Providence High School that is reported to contribute roughly 80% of the Training School's population. It is plausible to assume that differences

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[1] A third and less important distinction is that the Hurwitz delinquents came from lower SES backgrounds than the controls, a fact which should be expected to exaggerate IQ score differences. Berman's samples had roughly equivalent SES backgrounds; the differences in IQ scores can more easily be interpreted as representing real differences in mental capacity.

in SES background were relatively small. In addition, delinquents and controls were matched pairwise for race as well as age. *Differential environmental disadvantage does not readily explain between-group differences in the Berman study.*

In Hurwitz, both Study I and Study II used delinquent Ss which were uniformly from families at lower socioeconomic levels, while control Ss were from families at lower-middle or middle class socioeconomic levels. If it were true that the tests of temporal/sequencing abilities differed from the tests of spatial/perceptual restructuring abilities in their degree of culture-specific grounding, this distinction in the Ss' SES background would presumably bias the statistical results. We are unable to determine any basis for assuming this to be the case, and conclude that *environmental disadvantage is probably not an important factor in the Hurwitz findings.* The reader is referred to the descriptions of the tests in Appendix C.

Before leaving this question, however, we should note the Hurwitz study's own speculation:

> While we have no evidence to support the claim, the skewed distribution of social class membership in one of the two clinical populations together with the similarity of their deficits on tasks of voluntary sequencing raises the possibility that children with delayed or disturbed neuromuscular development are more likely to be identified as delinquents when they grow up in a lower-class context and to be identified as children with learning disabilities when they come from a middle-class environment (Hurwitz, 1972, p. 393).

3. *Are the purported neuropsychological deficits accompanied by school achievement deficits relative to ability?*

Neither of the articles contains any information on the delinquent Ss' academic status. Berman did collect data on grade-levels using the Wide Range Achievement Test but did not include them in the article because of what he sees as the subjectivity of the grade level concept and its vulnerability to confounding through environmental factors. His data do indicate that the delinquent sample was lagging significantly behind the control group on reading, spelling, and arithmetic (Berman, 1976). Whether this is a reflection of generally lower *ability* among the delinquent rather than the disabling effects of LD remains an open question (and one for which it is difficult to conceive of a satisfactory procedure).

4. *Are the neuropsychological deficits measured by the tests comparable to those perceptual and perceptual-motor disorders which are defined as being learning disabilities?*

In answering this question, it seems appropriate to avoid as much semantic nit-picking as possible. We shall approach it from this perspective: Do any of the tests appear to *not* involve significant perceptual processes? Are there any which appear to involve complex concept formation which is predominantly a function of general intelligence?

We judge the Lincoln-Oseretsky Test (Hurwitz, which divided it into two subtests) and the Finger Oscillation Test (Berman) to be tests of motor development which would fall outside all but a very wide definition of perceptual or perceptual-motor processes. At the other end of the spectrum, it appears that at least two tests--the Category Test and the Raven Progressive Matrices Test--overlap well into the domains of concept formation, and a third--Trailmaking Part B--is grounded in an academically learned skill.

The first of these, the Halstead-Reitan Category Test (in Berman's study), is said by Reitan to be

> "a relatively complex concept formation test which requires fairly sophisticated ability in noting similarities and differences in stimulus material, postulating hypotheses, ... testing these hypotheses, ... and the ability to adapt hypotheses.... While the test is not especially difficult for most normal [lesion-free] subjects, it seems to require competence in abstraction ability, especially since the subject is required to postulate in a structured rather than permissive context" (Reitan, 1966, p. 166).

The Raven Progressive Matrices Test (Hurwitz) is commonly used as a proxy measure of general intelligence (see review in Appendix C). Even though there seems to be agreement that it does indeed measure "perceptual adequacy," it is said to do so at an advanced level.

Finally, Part B of the Trailmaking Test appears to be extremely sensitive to how fast the S can remember which letter comes after which, in the Roman alphabet. If many of the Berman delinquents were school dropouts or reading retarded, it is plausible that the sequence of the ABCs had been differentially ingrained in the clinical and control samples. The Trailmaking Test Part B, scored as it is in elapsed time to completion, would be sensitive to such differences (Reitan, 1976).

The results of this recasting of the tests (remembering the borderline nature of some of the decisions) may be summarized as follows:

The control samples performed significantly better ($p \leq .05$) than the delinquent samples on...

1 out of 3 motor tasks,
1 out of 2 IQ-related tasks,
1 out of 1 achievement-related tasks, and
7 out of 12 perceptual and perceptual-motor tasks.

The delinquent sample did not perform significantly better than the control sample on any of the tasks.

These 18 test results were obtained from samples of 15, 13, and 45. Overall, they do comprise evidence that delinquents who have reached the point of being institutionalized tend to be outperformed on a variety of tests, including perceptual ones, by a comparable sample of "normal" youth who have never been arrested. This is a modest conclusion; it seems also a fair one. The evidence is too slender, from samples of too few, to justify much more.

Category 2: Magnitudes of Difference *(How great is the difference in incidence of LD, comparing delinquents with non-delinquents?)*

Summary: Only one study has reported incidence of LD among a sample of delinquents and a sample of non-delinquent controls. "LD" was diagnosed if the S scored in the impaired range on at least one subtest of a battery used to diagnose brain lesions.

Discussion: A truism bears repeating here: a statistically significant difference is not necessarily a substantively significant one. The preceding pages have dealt exclusively with the most elementary of the issues: when researchers have compared test scores of delinquent and non-delinquent samples, were the groups' scores different? Is there reason to believe that these differences would occur by chance at least less than five times in 100 trials?[1]

Now we are asking the much more direct (and policy-related question: *How do differences in mean test scores translate into percentage of non-delinquents who are learning disabled?*

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[1]Readers who are not familiar with "significance" as it is used in statistics should be aware that sample size also helps determine whether a difference in group scores is significant. For example, many of the Hurwitz "non-significant" differences for spatial tests would have become "significant" if differences of the same magnitude had been observed in a sample of 50 or 100 instead of 15.

The Hurwitz article does not address this question in detail. It does point out that all 15 delinquent boys in Study I scored below the 5th percentile on the Lincoln-Oseretsky Test or Motor Development, while only one of the normal boys obtained a score below the 70th percentile. Beyond that, no assessment of incidence rates was attempted. We would add as a general rule, however, that the fact that a statistically significant difference is obtained from a sample of 15 or 13 tends to indicate a "large" difference. The Hurwitz samples were so small that minor differences would usually be obscured.

The Berman study does make statements about incidence. After presenting the statistical results which were discussed earlier, the study presents the results of diagnoses which were made from the tests. Berman concludes that 56% of the delinquent sample showed at least one major disability "significant enough to warrant professional attention," compared to 23% among a control population. (Berman, 1975, pp. 44-45).

The diagnosis was based on a simple criterion: all of the Halstead-Reitan subtests have a cutoff score to distinguish impaired from non-impaired. A subject was classified as LD if he scored in the impaired range on any subtest of that battery. We shall not try to address the validity of this procedure. The Halstead-Reitan battery is just that: a battery of subtests, a critical feature of which is a summary "impairment index" based on the combined test results. It was designed to be used in conjunction with the subtest scores to diagnose brain lesions. It is of proven validity for that purpose; in applying it to diagnosis of LD, Berman breaks new ground. Questions of validity have yet to be tackled. Compared to standards used in popular discussions of the LD/JD link, the criterion is relatively conservative. In terms of the standards which were generally urged by the LD consultants for this study, use of a single subtest score to diagnose a specific learning disability is unacceptable. Berman's results show that more than twice as many institutionalized delinquents as non-delinquents scored in the impaired range on at least one subtest of a battery otherwise used to diagnose brain lesions. This finding is unquestionably intriguing. But it is a major leap from that datum to a conclusion by the reader that more than twice as many delinquents as non-delinquents are learning disabled.

We were unable to discover any other studies which directly compared incidence of LD among delinquent and non-delinquent samples. Instead, a number of studies were found which attempted to measure LD incidence in a delinquent population. We now turn to those studies.

Category 3: Incidence Among Delinquents *(How commonly do delinquents suffer from LD?)*

Summary: As of the end of 1975, no usable estimate was available. Different studies have applied widely disparate definitions of LD and have reached widely disparate results. Nor can it be deduced which is closest to the mark. All of them fall far short of a thorough, widely acceptable survey of incidence of LD among delinquents--some, because the objectives were limited; some, because of very severe problems in the conduct and presentation of the work.

Discussion: Of the many titles which suggest a study of LD among delinquents, only a few present incidence data. Of the many titles which suggest a study of learning problems and delinquency, only a handful deal with learning disabilities as such. The nature of the collateral evidence--the studies of reading retardation among delinquent youth, the anecdotal articles on LD among delinquents, the literature reviews--can be seen in the collection of titles in Appendix E. Here, the purpose is more limited: *When proponents of the LD/JD link claim, as in the quotations heading this chapter, that the high incidence of LD among delinquents has been proved, what evidence are they talking about?*

We identified six studies for which it is reasonable to critique an estimate of incidence. By that, we mean that the studies explicitly sought to diagnose LD among a delinquent sample which was not preselected on the basis of learning problems, and which sought to draw some conclusions about the incidence of LD. The studies are: Berman (1975), Compton (1974), Critchley (1968), Duling et al. (1970), Mulligan (1969), and Stenger (1975). A review of each study is given in Appendix C.[1]

This list of six omits some titles which persistently appear in reviews of the evidence. Some of these titles are descriptive evidence of the kind recounted in Section III. Holte's "Confessions of a Juvenile Court Judge" (Holte, 1972) is one example; Mauser's article, "Learning Disabilities and Delinquent Youth" (Mauser, 1974) is another. Some titles which are frequently cited deal with learning problems in general, and the data cannot be reconstructed to inform the question of LD. Dzik's "Vision and the Juvenile Delinquent" (Dzik, 1966) and the article by Margolin et al., "Reading Disability in the Delinquent Child" (Margolin et al., 1955) are examples. And, finally, some titles are mentioned which the authors themselves did not intend as studies of incidence of LD among delinquents, or which include an estimate of LD incidence in passing, without trying to expound on its technical legitimacy. This is not to denigrate the articles, but to point out that their inclusion as part of the scientific "proof" for the LD/JD relationship is unwarranted. Some of the principal examples of studies in this last category are as follows.

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[1]A study of LD incidence being conducted by the General Accounting Office was not available for review during this study.

The Oklahoma ACLD study, "Learning Disabilities and Predelinquent Behavior of Juveniles" (Jordan, 1974). This paper mentions briefly that 81% of more than 100 juveniles "manifested learning disability symptoms" on a screening test devised by Jordan and his colleagues (Jordan, 1974, p. 6). Of those who did show the symptoms, 80 subjects were selected for more intensive study. We have no other information about the 81% figure. The article does contain detailed information about the learning characteristics of the 80 subjects, but the Jordan report focused exclusively on the study group and the results of the treatment program, not on incidence. In effect, all it tells us is that 81% of the original set of candidates responded to a screening test in ways which could be interpreted by an unspecified set of criteria as indicating some form of LD. The 81% figure could be important or meaningless, depending entirely on the unknown factors.

Lester Tarnapol's article, "Delinquency and Minimal Brain Dysfunction" (Tarnapol, 1970). Tarnapol presented a preliminary report on a study of 102 male youths. He also incorporated into the article additional information on 165 enrollees in a Neighborhood Youth Corps Program (about 70% of the 102 had been in that program as well). The first insurmountable obstacle to using the Tarnapol article with reference to delinquents is that the proportion of either sample which represents delinquents is not stated. Some were adjudicated delinquents; some were uncaught delinquents; some showed no evidence of delinquency. Apparently something substantially more than half of the 165-enrollee sample had been adjudicated delinquents; nothing is specified for the 102-person sample except that "almost all had dropped out of school and had engaged in varying degrees of delinquency" (Tarnapol, 1970, p. 206). Aside from this fundamental problem (if incidence among delinquents is at issue), the article's discussion shifts between the two samples with very few explanations about who is being tested for what. In many cases, it is not possible to determine the population to which the test results refer. And samples shift in size: 85 members of one of the populations was administered the Bender Visual-Motor Gestalt Test; 44 of those were administered the Closure Flexibility Test, and 15 of those were administered the Oseretsky Motor Test. Why some subtests instead of others? Why were so many not tested? What were the background characteristics of the subpopulations? None of these questions are answerable. The article does offer interesting evidence of deficiencies--38% of the 85-person subtest scored in the abnormal range on the Bender-Gestalt, for example--but it is not legitimate to try to infer how the author would approach the question, "What is the incidence of LD among delinquents?"

Eugene L. Walle's "Communicative Disorders of Juvenile Delinquents and Young Adult Criminals," presented at the February 4, 1972 ACLD conference on LD and juvenile delinquency. Three problems

make this study inappropriate for purposes of estimating the extent of LD among delinquents. First, it did not examine juveniles. The average age of the sample was 26.4. Second, the "communicative disorders" which Walle sought to identify were predominantly physiological handicaps (e.g., hearing loss) and problems such as stuttering. Third, the sample is a highly selective one, taken from persons confined at a facility for chronic offenders who are also diagnosed as intellectually deficient or emotionally unbalanced. Any one of these three factors should prevent its citation as part of the evidence of LD among a delinquent population or, for that matter, any population.

We are left then with the six studies which do directly and explicitly confront issues of LD incidence among delinquents. They are reviewed relatively briefly, summarizing the more detailed critiques in Appendix C. In general, the review is a critical one. Before beginning it, two points should be made.

First, only two of the six studies (Critchley, 1968 and Stenger, 1975) were written for a scientific or academic audience. It is therefore quite possible that procedures in the other four were not fully reported. A lengthy account of, say, diagnostic techniques is not appropriate for a presentation to an ACLD conference. Sometimes we have been able to clarify issues through interviews with the authors; sometimes that has not been possible. Overall, it should be be remembered that we are assessing these studies by standards that most of them never pretended to meet.

This, however, leads to the second, extremely important point made at the outset of this section and reiterated here: the technical issues we raise are fundamental ones. *We are not assessing whether the estimates of incidence are off-base by a few percentage points, but whether they mean anything at all.* In the discussion which follows, we have deliberately tried to avoid pointing to technical errors which are only peripherally relevant.[1]

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[1]We make one exception via this footnote. There are a number of simple arithmetic and reporting errors in some of the studies which get in the way of our accounts of them. For example, in Table 4.2, something is wrong with the statement that 90.4% of 444 people had LD (or anything else): no whole number rounds off to 90.4% of 444. Or in the same table: why is the Berman sample shown as 46, when it has been reported elsewhere in this section as 45? The answer is, because Berman reported different sample sizes in different tables. Or in Appendix C, we reproduce Mulligan's tables on the 23 slow readers in his study--but only 19 cases are shown in the tables. These are errata which do not critically affect the articles' findings. But several of them will be apparent to a careful reader, hence a footnote.

Tables 4.2 and 4.3 summarize some facts about the studies: the populations from which the samples were drawn, sample sizes, reported incidence of LD, and the operational criteria which led to the

TABLE 4.2

Summary of LD Incidence Findings in the Existing Literature.

Study	Population	N	Diagnosed as LD N	Diagnosed as LD Percent
Berman	Institutionalized male delinquents	46	26	56
Critchley	Institutionalized male delinquents	106	not reported	
Compton	Institutionalized male delinquents	444	?	90.4
Duling	Institutionalized male delinquents	59	19	32
Mulligan	Adjudicated delinquents and children referred by schools for delinquent tendencies	32	4[1]	n.a.
Stengel	Males and females, non-institutionalized adjudicated delinquents	67	15	22

[1] 19 others showed some similar symptoms of varying severity, but funds did not permit full-scale diagnosis.

diagnoses. We shall briefly discuss each of these topics, then turn to a general methodological appraisal. Again, the reader is referred to Appendix C for details.

Populations. The use of institutionalized male delinquents in four of the six studies has the advantage of finessing at least some of the definitional questions surrounding delinquency. As a rule, institutionalization in a training school has been increasingly reserved for juveniles who have been adjudicated for offenses which would be crimes if committed by an adult. Increasingly, it has been reserved for juveniles who have been apprehended for more than one offense. So the populations in these four studies can plausibly be assumed to include few borderline cases. The *dis*advantage of using institutionalized delinquents is their unrepresentativeness. If the question is whether delinquent acts in general tend to be committed disproportionately by learning disabled youth, testing institutionalized delinquents for LD is likely to yield inferences based on very skewed samples. It should be assumed that status offenders are underrepresented and that one-time offenders are underrepresented. Most significantly, it should be assumed that out of the set of delinquents who *could* be committed to an institution because of their offense histories, the ones who actually *are*

TABLE 4.3

Operational Criteria for Diagnosis of LD Applied by the Incidence Studies

Study	Criterion for diagnosis of LD	Comments
Berman	Subject scores in impaired range on at least one subtest of the Halstead-Reitan Battery	The Halstead-Reitan tests were developed for use as a battery in diagnosis of brain lesions. Reliability of separate subtests for diagnosis of LD is unknown.
Compton	not specified	An extensive battery of established tests was used. "Mild", "moderate" and "severe" levels were specified. Bases for these classifications are not known.
Critchley	(dyslexia only) Reading retardation of 3 or more years if IQ $\geq$ 90, 5 or more if IQ $<$ 90; plus indications based on test batteries for dyslexia. Ocular, other medical and psychological explanations were checked.	Author assumes underdiagnosis of dyslexics because of stringency of the criteria.
Duling	Criterion cannot be reconstructed. Probably based on scoring beyond cut-off points on at least one of 3 or 4 tests.	Text is ambiguous and contradictory about tests used and scoring procedures.
Mulligan	(dyslexia only) Reading retardation of more than 2 years, plus indications based on batteries for dyslexia and medical history.	Funds were available for only four full-scale diagnoses.
Stenger	(1) Subject has academic difficulties, (2) WRAT more than 10 points below FSIQ, (3) difference between VIQ and PIQ more than 15 points or "significant" scattering of subtest scores"	VIQ/PIQ difference as indicator of LD has extensive and controversial literature. Widely seen as useful screening device; not adequate alone.

committed also tend to be those who are not getting along at school. The child who is "seriously" delinquent but also attending school regularly and not acting out in the classroom is more likely to stay out of the institution. In short, we suggest that an institutionalized delinquent population is selected in ways which will drive up the incidence of all kinds of learning problems even beyond the high levels of learning problems among delinquents in general.

Incidence estimates. The range of the estimates is impressive: from 90.4% to 56% to 32% to 22%. The disparity of estimates fairly reflects the disparity of definitions, procedures, and analyses in the studies.

Criterion for diagnosis of LD. Of the six studies, only two (Critchley and Mulligan) use an approximation of the operational definition which has been proposed (pp. 21-22); that is, one which requires evidence of underachievement relative to ability and consistent, multiple indicators of perceptual disorder. One of the two (Critchley) concluded on balance that the high rates of reading retardation did not indicate comparably high rates of dyslexia; but he did not eliminate the possibility. The other study (Mulligan) was truncated for lack of funds; the author believes that continuation of the study would have produced an unusually high number of diagnoses of dyslexia.

The Compton study deserves special mention with regard to diagnosis. Conceptually, Compton's approach to LD was very broad--"anything which prevents a child from achieving successfully in a normal educational setting" (Compton, 1974, p. 49). But actual diagnosis of the delinquents was conducted by use of an extensive set of established tests. The data referenced by Compton are potentially very rich, despite the obstacles to interpreting them from the published record.

The operational criterion used in Duling et al. is indecipherable. Details are given in Appendix C. The sum of the criticisms is that the more closely the article is read, the more difficult it is to understand how a subject was tagged "LD."

Stenger's criterion is attractive insofar as it demands evidence of underachievement relative to ability; but her reliance on the analysis of IQ scores and subtests as evidence of perceptual disorder raises a number of difficulties: the significance of VIQ/PIQ differences and the scattering of subtest scores is the subject of an active debate. There seems to be reasonably broad agreement that the procedure is a useful screening device.[1]

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[1]Jordan contends that the procedure produces underdiagnosis; that 37% of the LD children in his study group would have been missed if the diagnosis had relied on the Weschler scores (Jordan, 1974, p. 26). The more widespread assumption among the LD specialists we questioned is that the procedure tends toward overdiagnosis, insofar as it is usable at all.

The operational criterion used by Berman has already been discussed (see p. 55).

Methodological considerations. Overall, how do the studies match up against normal standards of data analysis and interpretations? The following are judgments summarizing the critiques in Appendix C.

Berman. This study represents a generally careful, competent administration of the tests in question. The two main issues about the LD incidence rates are: 1) How many of the delinquent sample (mean IQ = 90.6, standard deviation = 11.4) who were diagnosed LD were also mentally retarded? 2) Does a score on a single subtest constitute a meaningful definition of "disability?" With a sample size of only 46, even relatively small changes in numbers of LD diagnoses would produce large changes in the percentage estimates of incidence.

Compton. The raw data which Compton was using could well be an invaluable source of information about LD among delinquents. But the published record, meant for a nontechnical audience and using tabulations compiled for planning treatment needs, is unusable for estimating incidence of LD. An examination of the matrix in the article (see Appendix C, p. C8) indicates that a narrower definition of LD would cut the 90.4% figure drastically. When, for example, the reader asks about the subset of the Compton sample most likely to have met a strict definition of LD--"severe" cases of auditory, visual, and language processing disabilities--the percentage is less than 20%. It is probably *much* less, because the percentage is computed from diagnoses, not individuals (mean = 2.6 diagnoses per handicapped child) and the definitions of even these areas are very broad (including in language processing, for example, bilingual children who do not decode equally well in both languages). This does not mean that only the "severe" cases would have met a strict definition of LD (we have no way of knowing); the point is simply that the reader cannot work backwards from the published record into an estimate of what the data imply about learning disabilities among delinquent children.

Critchley. This article is by far the most scholarly, painstaking available discussion of dyslexia among a delinquent population. The discussion of method is precise and the interpretation of results is restrained. Critchley's is also the only study that fails to support the LD/JD link. This does not disprove the link, but it does raise the question: If the other studies had used a comparably rigorous approach to the clinical phenomena and the evidence of disability in learning, how deeply would their estimates of LD incidence have been cut?

Duling et al. Whether the problem is simply trying to decide what tests were used (one of them is given five different labels),

or for what purposes, or the results of the analysis, this article fails to give the reader consistent answers. A close examination of the text does not resolve confusion; it adds new questions.

Mulligan. This study, conducted at the Sonoma County Probation Department, is a potentially valuable study cut short. Diagnostic procedures appear to have been thorough, and Mulligan's presentation of case-by-case data is extremely helpful in interpreting the findings. But the case-by-case data also reveal that the sample of 32 children who were to be tested for dyslexia was very different--perhaps drawn from a completely different population--than the "total caseload" of 60 adjudicated, committable delinquents referred to the Special Supervision Unit of the Department for which reading-level data are initially presented (Mulligan, 1969, pp. 177-179). In particular, the smaller sample suffered from substantially more severe learning problems than the total caseload of the Special Supervision Unit. Insofar as we can reconstruct the procedure, it seems that the 32 were drawn from overall referrals to the probation department, not just from among adjudicated delinquents. The 32 included children referred under California's compulsory education laws for truancy or for acting out behavior in the classroom, even though they had committed no delinquent act. For some (unknown) proportion of the 32, then, the question was not "Do adjudicated delinquents tend to have dyslexia?" but "Do children with severe school problems tend to have dyslexia?"--two very different questions. This helps to account for the inference which could be drawn from the Mulligan data, that the adjudicated, committable delinquents had *fewer* learning problems than the borderline cases. In any event, the four children who manifested the most severe reading retardation, or who were already in classes for the educationally handicapped, were diagnosed and found to be dyslexic. Funds were exhausted before another 19 reading retarded children in the sample of 32 could be diagnosed.

Stenger. Within the limits set for itself, this appears to have been a carefully conducted survey. The author's attempt to distinquish between underachievement because of LD from problems of generally low mental capacity is especially welcome. The validity of the PIQ/VIQ approach to the diagnosis of perceptual disorders is a major question mark in interpreting the results.

Adding up the pieces of evidence and the obstacles to interpreting them, what can be said about the incidence of LD among delinquents? When a draft of this discussion was shown to reviewers of varying perspectives, the answers varied predictably. At one extreme, some argued simply that the studies had been subjected to a hatchet job. Another, sometimes related argument was that so much smoke must mean some fire. From another extreme, it was argued that the existing evidence that delinquents are disproportionately learning disabled is too slipshod to warrant serious attention. We obviously

do not share the first of these views. But we do share some common ground with each of the other reactions, when the quantitative studies are seen in the perspective of the other, less formal evidence which was obtained. The conclusions, and the recommendations we have drawn from them, are detailed in the following pages.

V. CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations which follow are grouped under three headings. The first of these, *the state of the evidence*, includes our summary reading of the state of knowledge about LD's role in causing delinquency. The second heading, *program recommendations*, deals with the next steps which appear to be warranted by the evidence. The third heading, *procedural issues*, highlights some measures which the OJJDP might wish to consider when implementing a program of LD-related activities.

A. The State of the Evidence

Repeatedly, articles and speeches about LD and delinquency present it as a relationship which has been more than adequately documented and still is denied the attention it deserves. A survey of the evidence argues against this view. As of the end of 1975,

> the existence of a causal relationship between learning disabilities and delinquency has not be established; *the evidence for a causal link is feeble.*

On the basis of the sketchy data so far produced, the notion that many delinquents have become so *because* of learning disabilities cannot be accepted. The notion that programs to diagnose and treat learning disabilities early will actually *prevent* delinquency is not supported by any data at all. Far from being "studied to death," as proponents of the LD/JD link sometimes claim, the link has scarcely been studied at all. The existing work that meets normal, minimal standards is fragmentary.

This is especially true of the quantitative evidence. An extensive effort was made to examine the text of every study which purports to have diagnosed learning disabilities among delinquents. Every reference cited in the literature reviews written by proponents of the link was examined. Additional published and unpublished studies were obtained independently in the course of our own literature search. Our appraisal is that

> with few exceptions, *the quantitative work to date has been so poorly designed and presented that it cannot be used even for rough estimates of the strength of the link.*

Numbers have an authority which makes them hard to ignore; but that authority is unwarranted for almost all of the existing work on LD among delinquents.

This is a harsh conclusion. It is because of that, and because the quantitative studies are cited so frequently as proof that the relationship exists, that Section IV and Appendix C go into such detail about each study, the methods used, and the conclusions drawn. The following findings emerged from that examination.

First, as in so many areas of delinquency research, the classic longitudinal test of the LD/JD link is far in the future: *No study has even been started which will compare the development of a set of LD children and a comparable set of non-LD children.* The existing work is *ex post facto*, subject to all the barriers to interpretation which that situation entails.

Second,

> *no study has yet been conducted which even claims to demonstrate that the average delinquent is more likely to suffer from learning disabilities than his non-delinquent counterpart.*

That is, no study has diagnosed LD among a non-delinquent population, diagnosed LD among a *general* delinquent population, then compared incidence between the two groups. Only two small-sample (N=15, N=46) studies have used a non-delinquent control group at all, and in both of these cases the delinquent sample was comprised of institutionalized youth--neither included the institutionalized delinquent's more numerous counterparts who are on probation or who have been diverted from adjudication.

Third, even if the comparison between delinquents and non-delinquents is ignored,

> *no estimate of the incidence of LD can be derived from the existing studies.*

The problems are *definitional* (different studies using different definitions of LD), *diagnostic* (studies failing to employ tests which fit their definition of LD), *prodedural* (subjective diagnoses being conducted by the same person who set out to prove that delinquents are learning disabled), *analytic* (inappropriate or simply inaccurate use of statistical tests) and *presentational*

(failure to tell the reader enough to let him interpret the author's results). And with the exceptions noted below, the studies suffered from more than one of these problems. Some suffered from all of them. It should be emphasized that the technical issues are fundamental ones. The conclusion is not that the estimates of LD incidence may be off-base by a few percentage points, but that they are simply uninterpretable.

Nonetheless, there are some things to be learned from the set of existing studies, despite the overall weakness of the evidence. Two studies (Berman, 1975; Hurwitz et al., 1972) demonstrated a statistically significant difference between samples of *institutionalized* delinquents and non-delinquents on some tests for perceptual and perceptual-motor disorders.[1] The test results are equivocal and sometimes conflicting, and institutionalized delinquents are a special case--generally, fewer than one apprehension in ten results in institutionalization.[2] But a kernel of usable evidence is there. A third study (Stenger, 1975) applied a screening test for LD on a sample of *non-*institutionalized, first-adjudication delinquents, and also estimated the proportion of this sample who were achieving below expectation in school. Twenty-two percent of the sample were *both* suspected LD and underachieving. No control sample was tested, nor can the possibility of over-diagnosis be ignored, but the 22 percent can plausibly be argued to exceed expectations for a normal population.

Adding up the fragments from these and the other studies, *even though most of the quantitative studies can be criticized for not grappling with learning disabilities as such, they persistently suggest a pattern of learning handicaps.* The studies may not have proved what they set out to prove, but they suggest that something is out there which deserves systematic investigation.

In developing this argument, we should start with a point that is too easily obscured by the technical critiques: Almost all of the literature on the LD/JD link has been written by practitioners who saw the relationship in the delinquents they treated and who then set out to prove it with statistics. They generally did a poor job of it. This does not mean that the original insight was wrong. On the contrary, although the first

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[1] "Statistically significant" as used here means that the difference in test scores of the delinquent and non-delinquent samples would be expected to occur by chance less than five times out of a hundred, if the true difference were zero. It does not imply a large difference, only a difference greater than zero.

[2] E.g., in the Philadelphia cohort study, the proportion of institutionalizations was 6.4% of apprehensions (Marvin E. Wolfgang et al. *Delinquency in a Birth Cohort.* Chicago: University of Chicago Press, 1972, p. 219).

major conclusion of this study is that the quantitative evidence for a link between LD and delinquency is feeble, the second major conclusion is that

> the cumulation of observational data reported by professionals who work with delinquents warrants further, more systematic exploration of the *learning handicaps* of delinquents.

A variety of loosely connected but compatible data support the conviction of these professionals that a disproportionate number of their client youth are unable to learn in a normal classroom setting, for reasons beyond their control.

By "handicaps" we include problems such as hearing loss, ocular impairment, or motor dysfunction--problems that share with LD (strictly defined) a clinical meaning and a susceptibility to solutions, either through direct treatment or through specific classroom techniques that work around the deficit. Thus, they are distinguishable from the all-embracing set of "learning problems" which undoubtedly characterize virtually all delinquents, but which call for the much more elusive solutions of generally better teachers, better schools, and more supportive parents.

We urge the importance of the distinction. The child who grows up in a home without books may well be suffering from a barrier to learning which is just as disabling as the one facing a dyslexic child. But to put the two children under the same label obscures important questions about what to do for each of them, with what priorities. That large numbers of delinquents have severe learning problems is not news. That large numbers have learning disabilities and handicaps of the narrower type we have described *would* be news, and news with important policy implications for the OJJDP.

One option for the Office is to ignore the existing scattered evidence until it has been filled out and expanded. But this would probably mean a very long wait. The prospect is for more of the same: inconclusive studies which confirm the convictions of the faithful without persuading the skeptics. In this sense, for the OJJDP to adopt a wait-and-see attitude is probably tantamount to foregoing systematic exploration of the relationship of learning handicaps to delinquency.

B. Program Recommendations

An examination of LEAA spending over the past four years reveals that substantial sums have already been expended in support of LD-related programs.[1] They may have been usefully

[1] See Table D.1 in Appendix D.

spent; they may have been wasted; but whatever their real effects, it is clear that the projects added very little to LEAA's understanding of LD's role in delinquency. The need for a coherent, carefully designed strategy is acute. And the first step is a simple one:

> *the OJJDP should not accept or reject LD-related grant applications on a case-by-case basis,* until a program strategy has been prepared and announced.

This moratorium should not apply to projects which have only a peripheral LD component. But it should be applied across the board to applications which have the diagnosis or treatment of LD as their main purposes. Definitions, designs, and implementation features for this type of project will have to be decided by the Office, not by choosing among random grant applications.

This points to the second basic guideline: for the immediate future,

> the OJJDP's interest in learning disabilities should fall in the research and evaluation sector, *not* in program applications.

LD and related learning handicaps are phenomena of potential importance to the Office, and every effort should be made to ensure that money is directed toward learning about them. This does not exclude demonstration projects; on the contrary, evaluation of a few carefully designed demonstrations could help answer some basic questions. But the appropriate time for broad applications is still in the future.

If research is warranted, what research? If demonstration projects are warranted, what demonstration projects?

Answers to these questions depend heavily on the OJJDP's policy priorities and resources. To the extent that the Office has a full docket of promising, fundable projects, LD-related efforts should take a relatively low priority. But as one proponent of the LD/JD link pointed out, the competition is not that impressive--there are no panaceas nor even very many new ideas for preventing delinquency and rehabilitating delinquents. The OJJDP has very few sure things on which to put its money. Below are outlined four efforts which we believe merit serious consideration. Two of them could be funded independently; the other two are appropriate for inter-agency collaboration.

The first of these efforts, a minimal response which could be fit within almost any ordering of the OJJDP's priorities, is *research to determine the incidence of learning handicaps, including LD strictly defined, among a few basic populations: the chronic juvenile offender, the first-time (or perhaps status) offender, and the non-delinquent.* The expense and sample size for this effort would depend on the precision with which incidence needs to be measured, and the degree of generalizability which is desired. The essential point is that the research be designed and executed in such a way as to provide statements of comparative incidence which can stand up to scrutiny. This effort could appropriately be financed solely by the OJJDP.

The second effort which is suitable as an independent project of the Office is a *demonstration project to test the value of diagnosing and treating LD, as an aid to rehabilitation of serious juvenile offenders.* Available data on this issue are sparse but provocative. Informal reports of the experiences of the Lathrop Park program, Project New Pride, and the Colorado Youth Services indicate that they have achieved higher success rates than usual, and that special attention to LD-like learning problems has played an important role in this success.[1] And independently of the data, it seems inarguable that if a delinquent is seriously learning disabled, knowing that fact and acting on it is important if a sensible treatment approach is to be developed. Perhaps the existence of the disability means that special educational programs are needed; perhaps it means that some kinds of vocational training are appropriate and others are not; perhaps it simply means that the staff of the facility can better understand and respond to the youth's behavior. A broad range of remedial approaches might be proposed; ideally, the demonstration project would investigate several of them.

Note that this project could have high value even if it is found that LD is *not* a major cause of delinquency. Regardless of LD's causal role, the populations of the nation's juvenile facilities can be presumed to include at least as many seriously learning disabled youth as the population at large. If the studies to date are even pointing in the right general direction, the proportion is probably higher, if only for correlational reasons. Given that, and given that LD is a genuine handicap, diagnosis and treatment should be part of a sound rehabilitation program.

In terms of projects to be sponsored by the OJJDP independently, we believe that the two efforts just described--carefully designed, adequately financed, competently executed--should comprise the extent of the initial program. In terms of

[1] Abstracts of these programs are given in Appendix D.

the OJJDP's overall interest in LD, two more projects deserve attention as potential collaborative efforts with other agencies.

The first of these is *a national inventory of learning handicaps among youth* which would permit profiles of critical populations and age groupings. The OJJDP's interests in learning handicaps are not limited to a comparison of adjudicated delinquents versus non-delinquents; the Office's responsibilities for prevention programs require information on a wide variety of vulnerable youth populations. And there are complementary needs from the educator's standpoint. The consultants on LD for this study repeatedly emphasized the many ways in which their work is hampered by lack of adequate epidemiological data. These considerations argue for a collaborative effort among the OJJDP and the appropriate agencies of the Department of Health, Education and Welfare. The advantages of uniform instrumentation, combined sampling designs, and shared financing are obvious. We stress, however, the need to *focus on clinical phenomena on which there is reasonable consensus among the professionals, and avoid yet another catch-all survey of "learning problems."*

A second high-priority prospect for collaboration would be *a demonstration project to identify and treat learning disabilities in an inner-city elementary or pre-school, with thorough followup research.* Several consultants, including some who were generally dubious about the causal effects of LD on delinquency, did see a strong possibility that LD could have much more potent effects when it occurs in an inner-city environment, with parents who perhaps have never heard of LD, than when it occurs in a suburb with parents who are not only aware of LD but are eager to use it as an explanation for their child's problems. Findings about what happens when LD is found and treated early in the high-risk inner-city environment could have high utility for shaping delinquency prevention strategies. But because it would also have high intrinsic value, a shared sponsorship would seem appropriate.

The two collaborative efforts described above by no means exhaust the number of useful possibilities. As a general injunction, we suggest that

> because prevention of delinquency overlaps so many areas of education, employment, and physical and mental health, *the OJJDP should identify and follow ongoing Federal projects related to LD among the youth populations which are most vulnerable to delinquency.*

Preferably, the OJJDP should become aware of these projects during their planning phases. In some cases, the OJJDP may simply wish to know what is being done; in others, to make the sponsoring agency aware of the delinquency implications of the project; in still others, to collaborate fully. In the case of the two projects we have suggested, it appears appropriate for the OJJDP to make the initial overtures.

Before leaving program recommendations, one final point: The causal issues raised by the LD/JD topic represent yet another instance of the need for a thorough, multi-year longitudinal study of the development of children in relation to their ultimate delinquent behavior or lack of it. The LD questions alone do not justify such a study, but they cannot genuinely be resolved without one. The same point is true, of course, of most of the other unanswered questions about the sources of delinquency.

C. Procedural Issues

The fields of LD and delinquency both deal with children in trouble. They tend to attract people who care about children and who measure their success in terms of children helped, not just children studied. This is an extremely desirable state of affairs for staffing treatment programs; it is not so desirable for staffing dispassionate research and evaluation.

The problem is compounded by growing public and political interest in LD and delinquency. Pressure on the OJJDP is building--not to conduct baseline research, not to conduct carefully structured demonstration tests, but to get something done, now, to apply diagnosis and treatment of LD to delinquents.

These two factors--the nature of the people who are most interested in LD and delinquency, and the nature of the pressure on program choices--have important implications for executing the kinds of limited, targeted, detached efforts which we have recommended. The principal implication, and one which we emphasize, is that

> *the ordinary RFP or grant application process will not produce the kind of product that is required,* if lessons are to be learned about the relationship of LD to delinquency.

If, for example, the OJJDP decides to sponsor a survey of LD incidence among delinquents and issues a general statement of the problem in an RFP, we predict that the end result will be to perpetuate the confusion. The contractor will use its definition of LD, its diagnostic battery, its experimental design, all of which will be critiqued after the fact and lead to calls for still another survey. Part of the reason is likely to be substantive: the highly charged nature of the LD and delinquency issues inherently increases the chances of tendentious research, or research that is extremely vulnerable to charges of bias. A second reason will arise from the OJJDP's own lack of identification with the results. Insofar as the research deals with Professor X's approach to LD, and that approach is not congenial to certain critics, the OJJDP will tend to keep the books open indefinitely.

So, for substantive reasons, we would argue that

> in the planning of research and evaluation projects relating to LD, *the OJJDP has a central role as honest broker;* one which cannot be passed on to a grantee or contractor.

This is not to say that the OJJDP has a natural image of being above the battle. But it is in a position to provide funds for thorough, carefully designed investigations and to act as a guarantor of the integrity and competence of the research. Perhaps even more importantly, the OJJDP is in a position to act as an arbiter of what facts are really at issue.

And for ensuring that the OJJDP is ready to use the results of the LD-related efforts it sponsors, we emphasize that

> the OJJDP should first reach internal decisions about the precise nature of the objectives of the research, the definitions of terms, and acceptable standards of design. *A good statement of the research problem is not enough,*

nor is the usual degree of guidance which is provided to contractors. The program of applied research and evaluation we have proposed is one instance when a substantial degree of central control is not only appropriate but essential.

There are several potential mechanisms for reaching these decisions. Common to all of them should be a way for the OJJDP to tap the services of persons who are leaders in research on

LD and research on delinquency. As the research specialists in these areas were identified for this study, it became apparent that the dialogue about the LD/JD link has been conducted almost entirely without their involvement. If any program is to be undertaken, it will be appropriate to move away from general policy-oriented appraisals (including ones like this), and away from the clamor of partisans on both sides of the issue, and obtain technical advice on some exceedingly technical points which must be resolved. The objective is to develop procedures whereby the OJJDP can contribute to the *accumulation* of practical knowledge on a topic that has thus far generated much more heat than light.

APPENDICES

Appendix A.
THE CONSULTANTS

Below are listed the persons who served as consultants for this study. For those who are academicians or who have written extensively, we have included a selected bibliography of works most pertinent to his topic area. For others who are professionals working directly with delinquents, we give an outline of the program for which they are employed. In all cases, the consultants served as sources of expert opinion, not as co-authors. No argument or conclusion of this study should be attributed to any consultant, except as specifically cited and referenced in the text. The listing omits some persons who participated in large group interviews, or who were contacted by telephone for a few questions.

Mr. R. Bauer
Supervisory Auditor
Project Director, GAO Survey of Impact of Learning Disabilities on Juvenile Delinquency, Colorado
General Accounting Office, Denver

Dr. Charles Baccum
Chief Psychiatrist
Colorado Division of Youth Services

The Colorado Division of Youth Services operates one of the largest programs in the nation for diagnosis and treatment of learning disabled delinquents. After a youth has been committed by the state, he is tested for learning disabilities by diagnosticians employed at the Colorado Division of Youth Services. Diagnostic testing typically starts with visual and audiometric screening examinations that measure sensory input. If results of a recent general achievement test are not available, such a test is administered and the results, including a handwriting legibility analysis, serve as the basis for further testing. If the youth does poorly on either the reading, spelling, or mathematics achievement subtest; or if the youth's handwritten test responses are found to be clumsy, semi-legible, or poorly coordinated, further testing is conducted. Such testing might determine the youth's reading comprehension level, non-verbal intelligence, visual perception ability, auditory discrimination ability, visual memory, or visual motor integration ability. In addition to the testing procedures mentioned above, all students are given a speech screening to determine articulation problems. If such problems are found, an auditory discrimination test is administered. In addition, the speech screening picks up mumbly speech, stammering, stuttering, nasality, and voice problems. Based on test results, personal observation by the learning disability diagnostician, and recommendations of the Department of Youth Services' psychologist, an individualized rehabilitation program is developed for each youth. Rehabilitation goals are determined and progress toward those goals is periodically measured.

Dr. Allan Berman
Associate Professor of Psychology
University of Rhode Island
Director, Neuropsychology Laboratory and Diagnostic Clinic
Rhode Island Training Schools

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Dr. Steven L. Bloom
Psychologist
Colorado Division of Youth Services

See program description under Baccum.

Dr. Eli M. Bower
Associate Dean, Graduate Division, Director, Health and Medical Sciences
Professor of Education
University of California, Berkeley

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Dr. William Cruickshank
Director, Institute for the Study of Mental Retardation and Related Disabilities
University of Michigan

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Careth Ellingson
Consultant-Special Education
Florida

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Dr. Delbert S. Elliott
Professor of Sociology
University of Colorado

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Ernesto Galarza
Consultant
San Jose Public Schools
California

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Judge Seymour Gelber
Family Division, Eleventh Judicial Circuit
Dade County, Florida

Dr. Travis Hirschi
Professor of Sociology
University of California, Davis

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Dr. Helen Hursch
Psychologist
Colorado Division of Youth Services

See program description under Baccum.

Thomas James
Director, Project New Pride
Denver, Colorado

The New Pride Project is a community-based intensive supervision project serving approximately sixty probationers. The project, which takes the form of a work-study program, serves as an alternative to institutionalization for juveniles, aged fourteen to seventeen, who have records of two or more prior adjudications of delinquency. The identification of learning handicaps, including learning disabilities, is a focal point of the diagnostic process. Remedial educational programs also are central to the rehabilitative services.

Dr. Richard Klendenen
Professor
Center for Prevention of Juvenile Delinquency
Director of Delinquency Control Center
University of Minnesota

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Dr. William Kvaraceus
Professor of Education and Sociology
Chairman, Department of Education
Clark University

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Dr. Phillip H. Mann
Director, Special Education
Development and Technical Assistance Center
University of Miami

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Dr. Jane R. Mercer
Sociology Department
Chairman and Professor of Sociology
University of California, Riverside

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Nancy Miles,
Will Edwards
Diagnosticians
Project Intercept, Denver, Colorado

Project Intercept is a community-based juvenile delinquency prevention and rehabilitation project serving youth under 16 years of age who are referred by the schools and by the juvenile justice system. Since the majority of youth in the Project are performing 2 or more years below grade level, each youth is tested for learning disabilities. Based on test results an individualized program of instruction is developed and administered by Project Intercept education personnel.

Dr. William C. Morse
Educational Psychologist
University of Michigan

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Dr. Thomas Murray
Assistant Administrator for Programs
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Judge F. Orlando
Family Division, Seventeenth Judicial Circuit
Broward County, Florida

Dr. Arthur Pearl
Professor of Sociology
University of California, Santa Cruz

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Dr. Kenneth Polk
Professor of Sociology
University of Oregon, Eugene

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Dr. Chester D. Poremba
Chief Psychologist
Children's Hospital
Department of Psychology

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Dr. Herbert C. Quay
Director of Programs in Applied Science
University of Florida

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Dr. Ralph Rabinovitch
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Hawthorne Center
Northville, Michigan

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Harold Rosenberg
Director of Special Education
Visalia Public Schools, California

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Dr. Margaret Q. Silberberg
Psychological Consultant (Private Practice)

Dr. Norman Silberberg
Vice President for Research and Education
Sister Kenny Institute, Minneapolis

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Richard Stuart
Director, Matthew School
Colorado Division of Youth Services

See program description under Baccum.

Sister Elizabeth Thro
Principal
Havern Center, Colorado

Havern Center is a center for children whose basic learning capabilities are intact but who have definite learning disability due to psychoneurological dysfunction. The school serves 64 children. Most of the new admissions are between 5 and 7 years old, and the school emphasizes the importance of early diagnosis and treatment. The remedial programs are based on a structured environment, (e.g., use of cubicles to reduce visual and audio distraction) and highly individualized treatment programs. Each teacher at the Havern Center has a Master's degree in Special Education or its equivalent. The Havern School is widely cited among learning disability specialists as a national leader in application of remedial techniques for severely learning disabled children.

Dr. Marguerite Q. Warren
Director of Youth Services
School of Criminal Justice, New York

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Dr. Franklin Wood
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University of Minnesota

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Appendix B.
TOPIC OUTLINE FOR THE LD CONSULTANTS

Each of the consultants had his or her special area of expertise; no single instrument could be taken into an interview and applied blindly. We did, however, try to spell out the major LD topics which pertained to the study. The result is shown on the following pages. A copy was given to an LD consultant at the outset, and the interviewer usually attempted to stay with its structure during the discussion. The emphasis and time spend on any one of the topics varied by the individual consultant's interests and competencies.

Topic Outline

Topic I: Issues of Definition and Classification. A major problem in relating LD to delinquency is deciding on boundaries. We are not trying to arrive at a single definition of LD; but we do want to identify some criteria for distinguishing among classes of LD phenomena, in ways which are pertinent to understanding the LD relationship to delinquency.

One obvious candidate dimension is the "hardness" of the LD type. At one end of the continuum would be those types which most unequivocally represent a perceptual disorder in processing spoken or written language. At the other extreme would be those types which are most easily confused with the results of environmental disadvantage or emotional disturbance. What criteria could be used to demarcate segments on the continuum? Is it even a reasonable task?

What other dimensions might be useful for explicating the relationships of subsets of LD phenomena to delinquent behavior? Ones based on etiology? Treatment modalities?

The definitional issues relate to a fundamental policy decision which the Institute must make. How should its interest in LD be delimited? Apart from the many substantive issues which will inform this question, what is your general reaction to the policy merits of using a broad definition of the LD domain, as contrasted with a narrow one?

Topic II: Diagnosis. The literature includes a number of studies which purport to have measured the incidence of learning disabilities among a sample of adjudicated delinquents. Almost always the reported percentages are very high. Obviously, they are key

data for supporting a link between LD and delinquency. In the LD field in general, reports of incidence rates are similarly important. If you had the task of assessing these results, how would you go about it? Specifically:

- Which types of LD are generally diagnosed with the highest reliability and validity? What has "highest" meant in terms of statistical tests for reliability?
- Which types of LD cannot yet be diagnosed with enough precision to permit a reliable statement of incidence?
- What do you see as the best existing work on incidence of LD among delinquents? Incidence in the general youth population? The incidence of delinquency among the learning disabled populations?
- Is there reason to believe that diagnosing LD among delinquents requires different techniques than diagnosing the same type of LD among non-delinquents?

To summarize our concern: In highly charged fields like LD and delinquency research, there are especially severe potential problems of interpretation when the diagnostic data are subjective, imprecise, or both. Given the existing literature, how severe are the actual problems?

Topic III: Treatment of Learning Disabilities. To date, we have had unexpected difficulty in finding quantitative studies of the effectiveness of the various remedial techniques. What do you see as the state of the literature on this topic? In particular, what do we know about long-term effects? As in the case of diagnosis, how comparable are results among delinquent and non-delinquent populations?

Topic IV: The Causal Link between LD and Delinquency. What follows is a typical statement of the causal rationale:

> The cycle begins with early problems at home. The child was showing perceptual and attention problems even prior to school, but the behavior was written off as "onery" or "uncooperative" personality. The child enters the early grades of school already accustomed to the fact that he won't be able to do things as well as expected of him, that he will fail and be humiliated continually. This prophesy is fulfilled in school as teachers, considering the child "a behavior problem," punish and ridicule him for failures or for behaviors that he cannot control. The child begins to think of himself as a loser, as someone who can never hope to live up to what people expect of him. Rather than face the embarrassment of continual failure in front of friends and teachers, the behavioral signs become even more pronounced. Clowning around and general disruptiveness become the ways which best insulate this youngster from having to face continual and repeated failure. He becomes much more successful as a clown or troublemaker than he ever could be as a student. Teachers now are completely diverted away from any learning problems and concentrate solely on how to deal with the child's behavior. He gets further and further behind, becomes more and more of a problem. Eventually he's suspended, drops out or is thrown out of school to roam the streets, and the inevitable road to delinquency is well under way. The original problems have never been dealt with; the child is thought of as incorrigible. His problems are seen as psychogenic, not as the result of deflated self-esteem and fears of inadequacy, all of which have been generated by disability. His prophecy of himself as a loser has been fulfilled.[1]

Our first request is that you critique the logic in this argument and suggest other causal arguments that may have merit. We also have these specific questions about the standard causal argument:

- To what extent does the argument apply specifically to the learning disabled, as contrasted with the slow learner or the retarded?

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[1] From a presentation by Allan Berman, transcribed in the report on "Symposium on the Relationship of Delinquency to Learning Disabilities Among Youth," Little Rock, Ark., 12/2-4/74.

- To what extent does the school itself and its differential treatment of exceptional children lead to subsequent antisocial or delinquent behavior?
- To what extent do different types of LD provoke generally negative school achievement? Or can the LD child characteristically find compensating positive experiences in some aspects of his studies?
- The evidence is persuasive that real incidence of youth crime has been increasing dramatically--far out of proportion to increases in the youth population. If this is true, how can LD be argued to explain any significant portion of the increase?

Topic V: Research Priorities. If you were administering the Institute budget, what research and demonstration projects on LD would you fund first?

Appendix C.
TECHNICAL SUMMARIES OF THE LD/JD STUDIES

One major intent of the research was to examine all studies which documented incidence of LD among delinquent populations, or the incidence of delinquency among LD populations. On incidence of delinquency among LD populations, we uncovered no evidence whatsoever. None of the literature searches revealed pertinent titles, nor did any of the consultants know of such work. Several of the consultants stated categorically that none existed. There is, however, a growing body of literature on the *incidence of LD among delinquent populations*. It falls into three broad categories: reviews of the evidence at second-hand; anecdotal first-hand evidence; and quantitative studies which attempt to diagnose LD among delinquents and, in the ideal case, among a control population as well.

A summary of the evidence from all three categories is given in sections III and IV of the report. But the literature in one category--quantitative studies--warrants critique on a study-by-study basis. Numbers do have an authority: if a study concludes that 62.5% of juvenile delinquents have learning disabilities, it is not enough either to pass that figure uncritically, or to discount it because of vaguely specified methodological errors. What follows, then, is a technical critique of each study of LD incidence among delinquents which is cited in section IV. To the best of our knowledge, the inventory is complete as of the end of 1975.

Each study was examined in terms of the following topics:

Representativeness of the sample. Is there reason to conclude that the delinquents in the study generally reflect the range and proportions of delinquent types? Or do inherent biases exist?

Controls. Was a comparable population tested with the same instrumentation?

Conceptual definition of LD. Does the study use an explicit definition of LD? If so, does this definition fit a narrow or broad construction?

Operational definition of LD. Are cut-off points established to distinguish between mild cases and severe ones? Between perceptual disorders and retardation? Between

perceptual disorders and general learning problems? Between perceptual disorders and auditory or visual handicaps?

Diagnostic tools. Are the diagnostic procedures specified? Are the procedures ones which can accurately test for the characteristics specified in the operational definition?

Diagnostic objectivity. Almost all diagnostic tests of LD require subjective judgments by the diagnostician. Since the motivation for the studies being examined was almost without exception to demonstrate the existence of the LD/JD association, there was a clear need to avoid researcher subjectivity in the diagnostic process. Were adequate safeguards adopted?

Statistical analysis. Are the statistical tests appropriate to the data? Are the results presented in a form that permits the reader to assess them? Are the results interpreted accurately?

A note on procedure: The tests which are used to diagnose LD are too many to permit a detailed investigation of the validity of each. With a few exceptions, we have relied on the standard reference, Oscar Kresen Buros' *Mental Measurements Yearbook (MMY)* and his *Tests in Print (TIP)*, and have restricted the commentary to basic statements about those tests.

Allen Berman, A neuropsychological approach to the etiology, prevention, and treatment of juvenile delinquency, in Anthony Davids (Ed.), *Child personality and psychopathology: Current topics*. Vol. 3. New York: John Wiley and Sons, 1976, in press. (N.B.: Critique is based on draft of the manuscript).

Sample. Forty-five boys, ages 15 to 18 years (mean 16.1), resident for the first time at a juvenile correctional facility. All were examined within first week of admission, randomly selected from the weekly intake rosters.

Control. Forty-five boys in a Providence inner-city public high school, matched pairwise with the clinical sample for age and race.

Conceptual definition of LD. None is explicitly stated. Although the author does use the term "learning disability," it should be noted that his main purpose is to assess broader neuropsychological "adaptive abilities." Deficits in these adaptive abilities are discussed in detail; the transition to the discussion of LD is not explained.

Operational definition of LD. Subject scored in the impaired range on at lease one subtest of the Halstead Reitan battery.

Diagnostic tools. Adaptive abilities were assessed through a modified Halstead Neuropsychological Test Battery, using changes incorporated by Reitan. The following tests were employed. Descriptions are taken from Reitan 1966.

Category test. The subject is seated in front of a milk glass screen, beneath which is an answer panel with four numbered levers. The test is divided into seven groups of pictures. As each picture is shown, the subject is to guess the unifying principle in that sequence. A bell rings for correct guesses; a buzzer sounds for incorrect ones. Through iterative experience, the subject is to infer the principle. Reitan writes that "The Category Test is a relatively complex concept formation test which requires fairly sophisticated ability in noting similarities and differences in stimulus material, postulating hypotheses that appear reasonable with respect to recurring similarities and differences in the stimulus material, testing these hypotheses with respect to positive or negative reinforcement (the bell and the buzzer), and the ability to adapt hypotheses in accordance with the reinforcement accompanying each response." (Reitan 1966, p. 166)

Tactual performance test. The blindfolded subjects fits differently shaped blocks into a form board, using each hand separately and then both hands. Finally, the blindfold is removed and subject draws a diagram of the board. The exercises test for tactile form discrimination, kinesthesis, coordination, manual dexterity, and visualization of spatial configurations.

Rhythm test. The subject is required to differentiate between 30 pairs of rhythmic beats which are sometimes the same and sometimes different. This test appears to require alertness, sustained attention to the task, and the ability to perceive differing rhythmic sequences.

Speech sounds perception test. The speech sounds perception test consists of 60 spoken nonsense words which are variants of the "ee" sound presented in multiple choice form. The test is played from a tape recorder with the intensity of sound adjusted to meet the subject's preference. The subject's task is to underline the spoken syllable, selecting from the four alternatives printed for each item on the test form. In addition to maintaining attention through 60 items, this test requires the subject to perceive the spoken stimulus-sounds through hearing and to relate these perceptions through vision to the correct configuration of letters on the test form.

Finger oscillation. This test is a measure of finger-tapping speed, using first the index finger of the preferred hand and then that of the other hand. The subject is given five consecutive ten-second trials with the hand held in a constant position in order to be sure to require movements of only the finger rather than the whole hand and arm. Every effort is made to encourage the subject to tap as fast as he possibly can. This test would appear to be rather purely dependent upon motor speed.

Trailmaking test. The trailmaking test consists of two parts, A and B. Part A consists of 25 circles distributed over a white sheet of paper and numbered from one to 25. The subject is required to connect the circles with a pencil line as quickly as possible, beginning with the number one and proceeding in numerical sequence. Part B consists of 25 circles numbered from one to thirteen and lettered from A to L. The subject is required to connect the circles, alternating between numbers and letters as he proceeds in ascending sequence. The scores obtained are the number of seconds required to finish each part.

Sensory imperception. This procedure attempts to determine the accuracy with which the subject can perceive bilateral simultaneous sensory stimulation after it has already been determined that his perception of unilateral stimulation on each side is essentially intact. The procedure is used for tactile, auditory, and visual-sensory modalities in separate tests. With respect to tactile function, for example, each hand is first touched separately in order to determine that the subject is able to respond with accuracy to the hand touched. Testing for auditory imperception makes use of an auditory stimulus achieved by rubbing the fingers together quickly and sharply in a light manner. The test for visual imperception is applied through use of a small, discrete movement of the examiner's fingers while the subject focuses on the examiner's nose.

In addition to the above tests, subjects were given the Modification of the Halstead-Wepman Aphasia Examination. According to Reitan, this test provides a survey of possible aphasia and related deficits. The test samples the ability of the subject to name common objects, spell, identify individual numbers and letters, read, write, calculate, enunciate, understand spoken language, identify body parts, and differentiate between right and left. The requirements of the test are so organized that these various abilities are tested, to some extent, in terms of the particular sensory modalities through which the stimuli are perceived. The organization provides an opportunity for determining whether the limiting deficit is receptive or expressive in character.

Wechsler Verbal IQ (VIQ) and Performance IQ (PIQ) scores were also available for the analysis.

Diagnostic Objectivity. For the administration and scoring of the tests, it appears that the most important sources of contamination were minimized. The procedures were adopted to ensure uniform administration of the tests, and, for the few cases in which subjectivity was a scoring factor in the tests, a conservative approach was reportedly employed.

Data Analysis. Means, standard deviations, and *t* scores were reported for each of the Wechsler subtests and for the components of the Halstead-Reitan Battery, for the clinical and control samples. A discriminant function analysis is reported, using five predictors: (1) Verbal IQ, (2) Peformance IQ, (3) Halstead's Impairment Index, (4) Trailmaking Test Part A, and (5) Trailmaking Test Part B. The discussion varies from a concise, retrained interpretation of the results to highly speculative conclusions (e.g., "the inability to profit from experience and the repeated use of poor judgment seem to characterize the delinquent's performance on both the Category Test and his overall life style." (p. 39). In particular, the discussion of LD has the appearance of an appendage to the main (and more precise) discussion of "adaptive abilities." It's interpretive statements do not call upon the test results.

Richard C. Compton, Diagnostic evaluation of committed delinquents in Betty Lou Kratoville (ed.), *Youth in trouble*. San Rafael, Calif.: Academic Therapy Publications, 1974, pp. 44-56.

Sample. Four hundred forty-four adjudicated committed delinquents or Children in Need of Supervision (CHINS) who passed through the central diagnostic receiving center during a ten-month period, July 1, 1972 to May 1, 1973. The 444 represent all youth who passed through the diagnostic center during that time.

Conceptual definition of LD. "Our philosophy [is] that a learning disability or dysfunction is anything which prevents a child from achieving successfully in a normal educational setting." It includes five areas of dysfunction: auditory, visual, language processing, sociological, and psychological. In short, it is an extremely inclusive definition.

Operational Definition of LD. The tests used to diagnose LD (see below) included a variety of established tests. The relationship of the test scores to the conceptual definition cited above remains unclear. Compton has reported that "It is true that our effort over the years was to identify and find means of identifying any block to learning but the basis for the study as published was strictly within the confines of a programmed concept of learning disabilities" (Compton, personal communication, 1976). Yet it would appear from the discussion in the article that the broader definition was in fact operationalized. The discussion relating to the classification process is presented below:

> One of the first questions we encountered in establishing a format for statistical accumulation of learning disabilities was the myriad variety of possible classifications.... In trying to simplify the procedure to an understandable form, we simply said there were five areas of dysfunction: auditory, visual, language processing, sociological and psychological. Visual and auditory areas could be pretty well defined and identified, but the problems of language processing were, to us, much broader and more numerous than most texts, specialists, and research articles listed and described. Consider the bilingual child, for example. If he has to work in English but uses Spanish as the decoding tool, he certainly has a learning disability problem and would be reflected in these statistics. If, on the other hand, he could decode equally well in both English and Spanish, he has no problem, and would not appear as a language processing statistic. The child that has never mastered the very basic mathematic skills would certainly have a language processing problem in any math program above his basic level. We had a student, for example, who had never mastered the utilization of the number 9. At sixteen years of age, he had learned simply to block out anything dealing with the number 9.... Once this was identified, two weeks of intensive effort

cleared up this processing problem. However, he would appear on the statistics as a language processing problem.... Social and psychological problems indicated are only those problems which would prevent the child from learning in a meaningful way in the classroom--i.e. the child who cannot function in a group, or one who cannot relate to an adult for learning, or a black who cannot learn from a white, or vice versa. The student who is conditioned to failure and/or the student with an extremely low self image are reflected here. Most of them have either social or psychological problems, but if such problems would not prevent success in learning, these problems would not appear within these statistics. One highly significant fact: 90 percent of those reflected in sociological and psychological problems are also reflected in one or more of the visual, auditory and language processing areas....

Basically, then, what I have said concerning classification of learning disabilities is a reflection of our philosophy that a learning disability or dysfunction is anything which prevents a child from achieving successfully in a normal educational setting.

A "mild" classification indicates that the problems could be worked out normally by a regular teacher in a regular classroom provided that the teacher is aware of the problem ...and could attack it in the correct learning mode....

"Moderate" problems must have more specialized treatment along with prescriptive individual classroom attention and could not succeed until this is done.

The "severe" problems...must have comprehensive treatment before even trying classroom work. Most of this treatment must be planned and directed by highly qualified specialists. (pp. 48-49).

Diagnostic Tools. Not discussed in the article. Compton reports that "Diagnosis was achieved through use of the Keystone Telebinocular, the Audiometer, the Beery Test of Motor Visual Integration, the Bender-Gestalt, the Wepman Test of Discrimination, the Wide Range Achievement Test, the Davis Reading Test, the Gilmore Reading Test, the WISC or WAIS, along with other referred testing accomplished by neurologists, psychiatrists, opthomologists, and audiologists. But more important was the fact that validity was determined only on the basis of the child's reaction to follow-up treatment"(Compton, personal communication, 1976).

Diagnostic Objectivity. All testing was conducted by persons other than the author.

Statistical Analysis. A matrix is shown with the five types of LD as rows and mild-moderate-severe-total classification as columns. *Calculation of numbers of students either by LD type or classification of severity is not possible from the matrix,* because cells show number of positive diagnoses, not numbers of students. A student could be counted more than once because he was diagnosed as having more than one type of LD (i.e., multiple entry in colums), or because he had more than one characteristic within a type (i.e., diagnosis of two types of auditory LD would result in multiple entry in the same row of the matrix). This is stated explicitly in the article; the author goes on, however, to interpret the totals for each type as representative of totals for individuals--which appears from his own description of the matrix to be an error.

Incidence of LD

As concluded in the study. The study indicates that 90.4% of the 444 committed to state institutions during the 10-month period fell into one or more of the cells of the matrix--was learning disabled by the author's definition.

As perceptual or integrative disorder. As they are described in the article, only two of the five categories appear to fit the definition of LD as perceptual and integrative disorders: the visual and auditory categories. Even in those categories, the study's definition appears to be extremely inclusive, apparently counting simple hearing or visual problems as an LD. Some of the language processing diagnoses probably fit the definition. Compton points out, however, that the problems he included were "much broader and more numerous than most texts, specialists, and research articles listed and described." The article also suggests that most of the children with perceptually-based language processing problems would also be diagnosed under either or both of the auditory and visual categories. The matrix of diagnoses were as follows:

TABLE C.1

	MILD	MODERATE	SEVERE	TOTAL
Visual	81	81	41	203
Auditory	60	41	17	118
Language Processing	38	106	31	175
Sociological	32	159	112	303
Psychological	41	117	77	235

Because of the multiple row, column, and cell entries per subject, actual incidence cannot be reconstructed. But these ranges can be estimated:

- Including all levels of severity, some unknown percentage less than 72.3% of the 444 subjects could be said to have visual or auditory learning handicaps.*

- Excluding from the definition those cases which could be treated in a regular classroom with a regular teacher (the "mild" category), some percentage less than 40.5% of the 444 could be said to have a visual or auditory learning handicap.

- Those requiring special classrooms (the "severe" cases) for an auditory or visual learning handicaps comprised something less than 13.1% of the subjects.

- Because the sample excludes delinquents who are not committed to a state institution, no inferences can be drawn about incidence of LD in the general population.

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*A maximum-likelihood deflator could be applied to these over-estimates, but it would have to assume that there are neither column nor row interactions--probably an unrealistic assumption. Since it would start with the datum that each learning handicapped subject has an average of 2.58 cell entries [1034/(.904 X 444)], the deflation effect would be substantial.

E. M. R. Critchley, Reading retardation, dyslexia and delinquency, *British Journal of Psychiatry* (1968), 115, 1537-1547.

Sample. One hundred six boys at a Remand Home and Classifying Center for the twelve Inner London Boroughs. The 106 were personally examined. An additional 371 were examined for simple reading retardation, through archival data. All were adjudicated delinquents. Names were taken consecutively from the weekly lists of referrals for psychological evaluation

Controls. None.

Conceptual definition of LD. This study confined itself to "reading retardation," meaning achievement substantially below the expectation for that age group, and dyslexia, defined as "unability to read with facility despite normal intelligence, intact senses, conventional instruction and normal motivation." (Drawn from Eisenberg, 1962, p. 1540.)

Operational definition. Reading retardation was operationally defined as retardation of three or more years for those with an IQ of 90 and above, and of five years or more for those with an IQ of 89 or less.

Diagnostic tools. For diagnosing reading retardation, Critchley writes that "Spelling (Schonell Graded Word Reading Test, or rarely, the Burt Reading Accuracy Test) were [sic] given as individual tests by the psychologist, and if the child was found to be retarded in reading he would also be given the Binet Vocabulary Comprehension Test." (p. 1539) The Wechsler Scale Series was administered for the intelligence test. For diagnosis of dyslexia, a three-part neurological test battery was employed, "based upon that used by MacDonald Critchley, Ingram, Gooddy and others...." (1540): (a) laterality preference (hand preference, eye preference, footedness, hair whorl, family history of handedness); (b) right-left orientation, finger agnosia, and clumsiness; and (c) dyslexia screening (writing the alphabet, spelling numbers to dictation, picture interpretation and naming, a geography test, seven separate drawing tests.

Diagnostic Objectivity. Unless the subject faltered in reading a standard eye chart during the initial test for vision (in which case literacy was checked), the neurological examination was conducted without access to the results of the reading tests. Test results "were examined in the light of the history and the reports of the medical, ocular, psychological and psychiatric examination," as safeguards against false-positive diagnoses. (p. 1541) Critchley estimates that the dyslexic condition was probably underdiagnosed because of the deliberately conservative procedures.

Statistical Analysis. Critchley provides detailed figures and tables of descriptive statistics, and diagnostic intelligence test results (with reports of statistical significance) broken into the "retarded in reading" and "not retarded in reading" groups. A similar breakdown is provided in terms of background/environmental variables. Critchley's positively stated conclusions appear to stay well within the limits of the statistical results he cites. Two more speculative conclusions are that apparent differences in dyslexia incidence among delinquents and non-delinquents are probably artifacts of differences in diagnostic environments, and that "scrutiny of the life-history of the more intelligent of the retarded readers to trace the relationship between early schooling, disruptive events and behavioral disorders, did not reveal the manner whereby a dyslexic child may drift into delinquency." (1546)

Florence Duling, Sally Eddy, Victoria Risko, "Learning disabilities and juvenile delinquency," RFK Youth Center, Morgantown, W.Va., 1970. Unpublished.

Sample. Fifty-nine students randomly selected from the RFK Youth Center (federal institution for male juvenile delinquents, aged 16-21), out of approximately 148 in the population.

Controls. None

Conceptual definition of LD. "Specific learning disabilities refers to one or more significant deficits in the essential learning processes, involving perception, integration, and expression, and not primarily due to sensory, motor, and intellectual retardation."

Operational definition of LD. Not clear. See the following discussion of diagnostic tools.

Diagnostic tools. A variety of intelligence, perceptual, and achievement tests were administered. The presentation does not unambiguously state which ones were used to diagnose LD. Our best effort at reconstructing the diagnostic procedure is as follows.

A test called the "Berea-Gestalt Test" was used to assess "visual-motor memory and discrimination skills." As described, it appears to be very similar to the Memory for Designs Test (see review of Hurwitz 1972). But we were unable to identify it through the standard compilations (MMY5, MMY6, MMY7, TIP-II). *Ss* with scores of 5 or more errors were classified as disabled on this quality.

A test for auditory discrimination was administered. It was variously called the California Auditory Discrimination Test (p. 6) and the Chicago Auditory Discrimination Test (pp. 8, 9, 14). It is also referred to as the Auditory Discrimination Test (pp. 10, 11) and the Auditory Test (p. 12). There is also a reference (p. 14) to "Wepman's scaling" of the auditory test. From this (and since no California *or* Chicago Auditory Discrimination Test can be found in MMY5, MMY6, MMY7, or TIP-II) we infer that the test in question is the Auditory Discrimination Test by Joseph M. Wepman. That test is reported to be a quick, inexpensive, reliable (test-retest coefficient of reliability is reported as .91) means of identifying auditory discrimination deficits in children from 5 to 8 years of age. Whether it is equally suitable for adolescents from 16 to 21 years of age is not mentioned. Three or more errors were counted as evidence of disability.

A left-to-right discrimination test, apparently developed by "Shedd" (no reference in the reprint we received), was administered. It too was not listed, nor was any test by Shedd, in the MMY5-7 or

TIP-II. A score of 12 errors or more was classified as evidence of significant disability.

The Goodenough Draw-A-Man Test was used to "test their [the *Ss*] conception of body image" (p. 6). The Goodenough drawing test is a widely used instrument for assessing a child's accuracy of observation and the development of conceptual thinking. The test's utility for discriminating between a specific learning disability and more general intelligence or maturation problems is extremely doubtful. It is thought not to be suitable for subjects older than 15 (the sample subjects in the study were 16 to 21). In all, its use in this study is subject to many questions.

Verbal discrimination skills were tested through the Huelsman Word Discrimination Test. Intended for grades 1 through 8, this test has no data on reliability. Norms are based on 1949 testing.

Diagnostic objectivity. No information.

Statistical analysis. Means, medians, and ranges of scores for each test in the battery were presented in terms of three populations: for the entire sample of 59; for members of the sample reading below grade level, regardless of IQ; and for the 19 members of the sample diagnosed as having specific learning disabilities. These populations overlap; it was impossible to deduce (and the authors do not provide) results for *Ss*. An even more important omission was a set of tables showing frequency distributions of scores for the LD and non-LD populations. These problems are in addition to the obvious one, of ignorance about how an *S* was labeled "LD"--because of one test score, the profile of scores, or whatever.

In summary, this study is extremely vulnerable to criticism of diagnostic tools, procedures, and presentation. Its results as given in the Duling paper are uninterpretable and should be discounted whenever cited as evidence of LD in delinquents.

Irving Hurwitz, Roger M. A. Bibace, Peter H. Wolff, Barbara M. Rowbotham, Neuropsychological function of normal boys, delinquent boys, and boys with learning problems, *Perceptual and Motor Skills*, 1972, 35, 387-394.

The article reports two studies which are discussed separately here.

STUDY I

Sample. Two clinical samples were used, each of fifteen boys ages 15.6-15.5 years. One sample was of fifteen boys enrolled in a residential special school for treatment of demonstrated learning problems. All were at least two years behind age mates in reading level but were of normal intelligence and free of major neurological, sensory, or other organic illnesses or evidence of psychosis. The fifteen delinquent boys were being detained at a reception center, were of normal intelligence, and also were free of major illnesses and obvious psychotic symptoms.

Controls. A sample of fifteen boys of normal academic achievement in a suburban junior high school, of the same age and IQ range as the clinical samples, free of academic, social, or psychological problems as judged by teachers and school counselors.

Conceptual definition of LD. Not specified.

Operational definition of LD. Not applicable: no diagnosis of "LD" was attempted.

Diagnostic tools. Study I sought to measure sensorimotor development using the Lincoln-Oseretsky Test of Motor Development, 36 items which test both gross motor coordination (e.g., balancing, jumping), and fine motor coordination (e.g., sorting matchsticks).

Diagnostic objectivity. Test scores were reviewed independently by two of the authors (Hurwitz and Bibace). There was no disagreement on any of the 36 items, ". . . to be expected since performance on most items was reported as pass or fail and did not depend on equivocal criteria." (389)

Statistical analysis. The presentation in the article is succinct and worth quoting in full:

> Performance on the Lincoln-Oseretsky Test was analyzed by pooling the scores for all three groups, assigning ranks to the individual scores, and determining the distribution of rank orders (Kruskal-Wallace analysis of variance test by ranks; Siegel, 1956). Differences between the normal and the two clinical groups were statistically significant. Only one of the normal boys obtained a score below the 70th percentile, while all but one *S* with learning disability, and *all*

delinquent *S*s scored below the 5th percentile. When test results for the clinical and normal populations were divided into those falling above and below the 5th percentile, the differences were statistically significant ($\chi^2 = 29.8$, $p < .001$). These comparisons indicate that adolescent boys with learning disabilities and juvenile delinquents were significantly retarded in their motor development when compared to normal boys of the same age.

The 36 tasks on the Lincoln-Oseretsky Test were divided into those which required specific competence in rhythmical repetition (6 items) and those clearly not requiring the sequential organization of isolated elements (27 items). Three items were eliminated because they could not be classified unambiguously. When the over-all Lincoln-Oseretsky performance of the three groups was subdivided into items demanding rhythmical skills and those not requiring such skills, the two clinical groups performed consistently poorer than normal *S*s on 5 of the 6 items demanding sequential organization and more poorly in only 17 of the 27 non-rhythmical tasks. A group comparison of performance on the rhythmical tasks was statistically significant whereas a comparison of the non-rhythmical items was not ($\chi^2 = 8.0$, $p = .01$). Tasks demanding rhythmical repetition therefore posed far greater difficulties for both clinical groups than non-rhythmical tasks. (pp. 389-390)

The statistical methods appear to be appropriate for the data, and the findings as stated accurately draw from the statistical results.

STUDY II

Sample. Thirteen boys in a state training school for juvenile offenders, mean age 11.7 years, IQ range of 73-108, mean 96 (WISC); other criteria as in Study I.

Controls. Thirteen boys attending a sixth grade of a suburban public school, mean age 11.3 years, IQ range 84 to 136, mean 118 (WISC). Mean IQs of the clinical sample and the control were significantly different (.05 level, *t* test). SES backgrounds also differed: all delinquents were from lower SES levels; all the normal boys had middle class backgrounds

Conceptual definition of LD. Not specified.

Operational definition of LD. Not applicable.

Diagnostic tools. Study II sought to expand on the evidence from Study I that delinquent boys had special difficulties of sequencing ("temporal organization"). Two performance dimensions were tested, as follows.

Temporal organization of voluntary actions was assessed first through measures of *sensorimotor rhythm*. *S* was instructed to tap two mechanical keys, alternating the left and right hands, and maintaining as steady a rhythm as possible. Each trial lasted 45 seconds, and 10 trials were given to each *S*. Each child was allowed to practice with keys until he could manipulate the keys with some skill and understood the basic procedures outlined below. The 10 different trials given to each *S* consisted of variations on three basic instructions: (1) tapping at a preferred rate which was comfortable for the individual, with the only stipulation that *S* had to maintain as regular a beat as possible; (2) tapping in time to a metronome which was set at one of four different rates, and continuing at this rate after the metronome was turned off 15 seconds after the start of the trial; and (3) tapping in time to a metronome set at one of five different rates and maintaining the *initial* rate after the metronome rate was changed (either speeded up or slowed down) 15 seconds after the start of the trial.

The tapping was recorded on a magnetic tape and analyzed by computer in 15 second episodes as well as for the entire 45 second trial. Performance was analyzed for deviations from the expected entraining rates of the metronome (except in the case of the "preferred" rate), and for the variability of peak-to-peak intervals between successive pulses.

Temporal organization was next assessed on the domain of *automation*. These measures consisted of over-learned tasks in which *S* had to carry out repetitively a simple procedure whose isolated elements presented little or no intellectual difficulty. The tasks included the naming of repeated objects by identifying three familiar pictures (fly, tree, and cup) presented 100 times in random order on an 8½ inch by 11 inch card; and the Stroop Color-Word Interference Test. Performance was scored as the number of seconds required to complete each task. No current information is available on reliability or validity of the Stroop Test.

Spatial ability and perceptual restructuring were assessed through the following tests:

1) The Beery-Buktenica Visual-Motor Integration Test. The child (ages 2-15 for the long form) copies 24 geometric forms. It is rated as a generally sound instrument for detecting children with visual-motor integration, with some unanswered questions about reliability and predictive validity. (MMY7, 867).

2) The Graham-Kendall Memory-for-Designs Test. The subject is asked to reproduce each of fifteen simple straight-line designs after exposure to it for five seconds. Test-retest reliabilities are good (.73 to .90), and it is considered to be a generally sound, objective test for brain damage in children and adults, with special applicability for predicting dyslexic characteristics. (MMY6, 140; MMY7, 101).

3) The Children's Embedded-Figures Test. This test asks the subject to find a simple form (e.g., a tent) in a complex one. It seeks to measure psychological differentiation (also labeled "field dependence-independence"): "the extent to which perception of a part of a stimulus field is influenced by the entire field, or the ability to overcome embedded contexts in perception." Internal reliability estimates are good, ranging from .83 to .90; concurrent validity estimates for 11 to 12 year olds (the dominant age range of the subjects in Study II) are also good: .83 to .86. (MM7, 53)

4) Standard Raven Progressive Matrices. The subject chooses from multiple choice options the design or design part which best completes a test design. The test is sometimes used to estimate general intelligence, but it provides "a measure of perceptual adequacy rather than of intellectual capacity." (MMY6, 491) (Hurwitz points out that within the domains of general intelligence, it has been found to have a high factor loading for spatial abilities.) Reliability coefficients for earlier version of the test were good (.76 to .91); reliabilities for the version used by Hurwitz *et al.* were not obtained. (MMY6, 491)

Diagnostic objectivity. Procedures were not specified. With the single exception of the Beery-Buktenica test, subjectivity is minimal for the battery in use.

Statistical analysis. A table shows the means and standard deviations for the delinquent and normal *Ss*' test scores on each test. The *t* statistic (in some cases, the *F* ratio), and its probability level is given. The results are stated as follows:

> The delinquent boys performed significantly less well on motor-tapping tasks than normals. Their poorer performance is reflected both in the significantly larger deviations from the entraining rates set by the metronome and in the greater variability of tapping rhythms as measured by inter-peak intervals. Delinquent boys were also consistently slower on the automatization tasks. In contrast, no group differences were found on the four spatial abilities tasks. The correlation between IQs and spatial and temporal tasks within each population was not signifcant, suggesting that our measures of spatial and sequencing skills were independent of standard intelligence tests. An analysis of covariance was carried out with intelligence as the control factor, and scores on the various other tasks as criterion variables. The Raven Matrices was the only test which showed a significant *F* value ($F = 10.4$, $p = .01$), which indicated shared variances to the extent that IQ differences contributed to the observed differences between the means of the two groups only on this task. This observation is not unexpected in terms of the Raven's presumed capacity to measure intellectual ability. (pp. 391-392)

The statistical methods appear to be appropriate for the data, and the findings as stated accurately draw from the statistical results.

Overall conclusions about incidence of LD. Hurwitz *et al.* avoided trying to diagnose "LD"; their purpose was to contribute to an understanding of specific functional disturbances. The authors did not report incidence rates for those disturbances. They were investigating the simpler issue of whether a difference existed between delinquent and control populations. The studies appear to be carefully designed, carefully conducted ones. The concluding discussion states both the results and the implications with precision. It is quoted in full:

> Juvenile delinquent boys from lower socioeconomic background and poor learners from middle-class environments were significantly retarded on a broad spectrum test of motor development when compared with normal age mates of similar intelligence. The most sensitive index of poor motor performance in the delinquent groups included those test items requiring the sequential organization and coordination of isolated elements. In further comparisons of normal and delinquent boys, we found the latter had specific difficulties in tasks demanding the sequential ordering of sensorimotor and verbal elements.
>
> The findings suggest that the neuropsychological deficits of delinquent boys and boys with learning disabilities are manifested more clearly in tasks of temporal sequencing than in tasks of perceptual restructuring. In our battery the sensorimotor tapping and automatization tasks shared the requirement for competence in the sequencing of repetitive actions. Studies of *normal* children have demonstrated a high intercorrelation among the various automatizing tasks as well as among the various tapping items and a significant positive correlation between automatization skills and rhythmical tapping, but no correlation between sequencing skills and spatial abilities. The clinical populations in these two studies showed apparently specific deficiency in the temporal ordering of elements in voluntary behavior. Since our evidence for an association between learning problems or delinquency and deficits in sequencing skills was statistical, disturbances of voluntary sequencing can obviously not be construed as sufficient cause for either of the clinical entities. Yet the statistical association suggests that neuropsychological disturbances affecting particularly the child's ability to sequence sensorimotor events and symbolic stimuli may define one general adaptive function in which the two clinical populations are deficient. The inference is compatible with the observation that groups of children with learning disabilities and juvenile delinquents demonstrated a significant delay in motor

maturity and emphasizes the need for more detailed investigation of central nervous system function in the two clinical groups even when they manifest no gross evidence of neurological lesions.

While we have no evidence to support the claim, the skewed distribution of social class membership in one of the two clinical populations together with the similarity of their deficits on tasks of voluntary sequencing raises the possibility that children with delayed or disturbed neuromuscular development are more likely to be identified as delinquents when they grow up in a lower-class context and to be identified as children with learning disabilities when they come from a middle-class environment.

Until an operationally defined taxonomy of the various functional disturbances contributing to learning disabilities and juvenile delinquency has been formulated, the indiscriminate disposition of all delinquents as if they constituted a homogeneous clinical population should be abandoned for a sound clinical assessment of each individual with the advice of informed neurological consultation. (pp. 392-393)

William Mulligan, A study of dyslexia and delinquency, *Academic Therapy Quarterly* (1969), 4(3), Pp. 177-187.

Sample. Mulligan reports data on two samples. One is of the 60-person "total caseload" active in the spring of 1968 at the Special Supervision Unit of the Sonoma County Probation Department. "Wards supervised by this unit are the more severely delinquent children on probation, all of whom could be committed to the California Youth Authority for their delinquent acts" (p. 177). Reading retardation data are presented for these youth. Then Mulligan discusses a sample of 32 children, some of whom were delinquent and others whom were referred to the Probation Department under California's compulsory education laws for truancy or for non-delinquent disruptive behavior in the classroom: "children exhibiting delinquent tendencies" (p. 184). Note that the 32-subject sample is *not* a subset of the 60-subject sample. It is not clear whether there is overlap.

Controls. None.

Conceptual definition of LD. The study focuses on dyslexia, using a formulation of dyslexia as the defective language achievement in an individual who has normal intelligence and normal achievement in all other areas of learning (p. 180).

Operational definition. Reading retardation (more than 2 years below grade level) accompanied by positive indications on a series of tests for dyslexia (see below).

Diagnostic tools. For preliminary screening, diagnosis checks medical history (including prenatal history, and family history when possible), IQ (Peabody Picture Vocabulary Test), reading level (Wide Range Achievement Test) and other nonstandardized items to check on gross motor coordination, cerebral dominance, visual discrimination, directional discrimination, auditory discrimination, number recall, and rhythm sequence and retention. If the screening warrants it, the child is them referral to a local committee composed of "pediatricians, M.D.'s, optometrists trained in developmental vision, psychologists, and educators who are interested in the problems of the dyslexic child and in developing a diagnostic center" (p. 183).

Diagnostic Objectivity. Procedures were not spelled out, but the variety of measures and observers involved in the process appear to offer considerable protection against error in any one person or indicator.

Statistical Analysis. Mulligan writes:

> Of the thirty-two delinquency cases screened to the time of this writing, nine children of average I.Q. were reading at grade level or within two grade levels of their actual grade placement;

eleven of average I.Q. were reading well below grade level, and twelve with below average I.Q. were reading well below grade level. Four of the twenty-three youngsters reading below grade level were diagnosed as dyslexic. Unfortunately no funds were available to diagnose the other nineteen. However, all nineteen of these children had symptoms in common with the four diagnosed children (p. 184).

Mulligan also gives the following tables:

TABLE C.2

Children Diagnosed as Dyslexic

Age	9	15	10	12
I.Q.	89	75	104	106
Grade	E.H.	9	5	E.H.
Reading Level	2.2	.4	1.4	2.5

Average I.Q.-Reading Below Grade Level

Age	15	17	16	18	17	16	16	15
I.Q.	89	108	97	94	90	94	101	100
Grade	8	11	10	11	10	11	10	9
Reading Level	3.5	6.8	1.4	6.6	2.2	8.7	6.3	2.6

Low I.Q.-Reading Below Grade Level

Age	16	16	17	16	16	16	17
I.Q.	86	76	83	85	78	81	76
Grade Level	10	9	10	10	10	9	10
Reading Level	1.7	1.7	2.4	2.3	2.3	5.2	5.6

Thus, 12.5% of the 32 were diagnosed as dyslexic, and the other 46.9 who were reading well below grade level (more than 2 years) were reported to have similar symptoms of greater or lesser severity.

These results were obtained from a sample which apparently was either partially or wholly different from the 60-person sample of all cases sent to the Special Supervision Unit. Mulligan includes case-by-case data on both samples, and the smaller one cannot be matched with members from the larger one. For example, none of the four children diagnosed as dyslexic have age/grade/reading level counterparts in the larger sample. It appears also that the sample from which the dyslexics were diagnosed had much more severe reading problems than the overall case load. In the 32-person sample, only 28.1% were reading within two grade levels of placement; in the 60-person sample, 55.3% of children for whom reading levels were specified by grade within the two-year margin.* Moreover, it appears that the degree of retardation was much more severe in the 32-person sample than in the entire case load. Of those who were more than two years behind grade level, the mean difference between reading and grade level was almost six years in the 32-person sample, compared to about four years in the larger sample (calculated for those for which reading grade levels were specified).

The conclusion to be drawn from these observations is simply that the degree of reading handicap in the 32-person sample was much higher than for the overall case load of the Unit.

A second set of problems arises in drawing inferences about dyslexia in the 19 slow readers who did not undergo full-scale diagnosis; for it is extremely doubtful that the first four were drawn randomly from among the 23. Two of the dyslexics came from educationally handicapped classes and the other two showed the two lowest reading scores of the sample. Their average age was 11.5 years, while the *youngest* of the others was 15 years old. All the indications are that the four most likely to be dyslexic were chosen for the initial diagnosis.

The above points are raised to caution against the use of the Mulligan data for estimates of incidence. Something more than 12.5% and less than 71.9% of the 32-person sample were diagnosable as dyslexic; an incidence envelope which sample bears an unknown relationship to that of the full case load of the Unit. In terms

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* If those in the 60-person sample who were labeled "below average," "low," "very poor," or "very low" are assumed to be reading more than two years below grade level, the percentage of non-retarded readers would still be 44.9%.

of simple reading retardation, the smaller sample was on the order of twice as retarded as the full case load. Mulligan himself did not attempt to draw estimates of incidence from the data. The article is a valuable source of information about the kinds of symptoms which were observed, and about the collateral school behaviors which the children exhibited.

Mary Kay Stenger, Frequency of learning disabilities in adjudicated delinquents, unpublished master's thesis, University of Missouri--Kansas City, 1975.

Sample. All of the 67 white adolescents (mean age 15.4 years, minimum 11-0, maximum 16-11) adjudicated delinquent for the first time in Clay County, Missouri, Juvenile Court, during the period 1/1/75 through 5/31/75.

Control. None.

Conceptual definition of LD. The author quotes the National Advisory Committee definition and cites other definitional approaches, but does not explicitly adopt a conceptual definition for her study.

Operational definition of LD. School reports were reviewed for each S. On that basis, each S was classified as having academic difficulties (low or failing grades) or having no academic difficulties. Only the Ss with academic difficulties were screened for classification as LD. They were so classified if they 1) had a 15+ point discrepancy between the VIQ and PIQ of the WAIS or WISC; or 2) had "significant scattering" on subtest scores, defined as a 3 point difference from the mean of their scale scores;" and 3) had achievement levels on the WRAT below their ability range (WRAT Standard Score at least 10 points lower than FSIQ). (Stenger, 1975, p. 12)

Diagnostic Tools. As indicated by the operational definition, diagnosis was based on school grades and scores on the Weschler Adult Intelligence Score (WAIS) or the Wechsler Intelligence Score for Children (WISC), and the Wide Range Achievement Test (WRAT).

Diagnostic Objectivity. Researcher subjectivity is not a significant factor with the Weschler and WRAT, given the ordinary procedures for administering the test.

Statistical Analysis. Thirty-six of the delinquent sample were classified as having school difficulties. Fifteen of these met the criteria of LD in the study. The other 21 were classified as achieving at their (low) ability level. Thirty-one (46.3%) of the original sample of 67 had been classified as having no school difficulties; their Weschler scores were in the high normal range, WRAT scores were in the average range, consistent with their school performance.

The author points out that (1) the Wechsler and WRAT provided screening procedures, not an in-depth diagnosis. Some false-positives are probably included in the diagnoses (Stenger, personal communication, 1976); and included no members of minority groups

and was drawn from a suburb with a median family income of $11,000 per year, which might account for some of the discrepancy between Stenger's findings and the much higher rates reported by others. But the author argues that the main factor was the distinction between Group II (low ability and low achievement) from Group III (discrepant ability and achievement).

Appendix D.

INVENTORY OF DEMONSTRATION PROJECTS LINKING LD AND DELINQUENCY

The project abstracts included in this appendix represent four years (FY 1972 - FY 1975) of LEAA funding in the areas of LD detection and remediation. The criteria used in selecting projects to be abstracted have been described in the first section of this report. It should be reiterated, however, that telephone research was not conducted for projects that received funding in FY 1972 and FY 1973. This fact accounts for the small number of FY 1972-73 abstracts, relative to the number for FY 1974-75. Table D.1 summarizes the principal characteristics of the LD and education-related projects funded by LEAA during the entire period.

TABLE D.1

LEAA-Funded Juvenile Delinquency Projects Related to LD and Education, FY1972-1975.

	LD-specific	LD component in larger educational program	LD Component in general program	TOTAL WITH SOME LD COMPONENT	OTHER EDUCATION-RELATED
TOTAL	$96,000 (4)*	$480,000 (20)	$504,000 (21)	$1,080,000 (45)	$5,208,000 (217)
Intervention intended for . . .					
Diagnostic purposes	–	48,000 (2)	192,000 (8)	240,000 (10)	888,000 (37)
Treatment purposes	24,000 (1)	96,000 (4)	96,000 (4)	216,000 (9)	3,408,000 (142)
Both	72,000 (3)	336,000 (14)	216,000 (9)	624,000 (26)	1,656,000 (69)
Stage of intervention . . .					
Pre-delinquent	–	144,000 (6)	72,000 (3)	216,000 (9)	1,896,000 (79)
Intake	24,000 (1)	24,000 (1)	144,000 (6)	192,000 (8)	456,000 (19)
Post-adjudication	48,000 (2)	216,000 (9)	48,000 (2)	312,000 (13)	1,728,000 (72)
More than one stage	24,000 (1)	96,000 (4)	240,000 (10)	360,000 (15)	1,464,000 (61)
Primary intervention facility . . .					
Training school	48,000 (2)	48,000 (2)	–	96,000 (4)	720,000 (30)
Community-based residential	24,000 (1)	96,000 (4)	48,000 (2)	168,000 (7)	1,128,000 (47)
Court intake facility	24,000 (1)	–	192,000 (8)	216,000 (9)	528,000 (22)
"Youth Services Bureau"	–	72,000 (3)	144,000 (6)	216,000 (9)	1,392,000 (58)
School system	–	264,000 (11)	120,000 (5)	384,000 (16)	2,160,000 (90)

* Number of programs

1 9 7 2

Contractual Services and Educational Materials
Alabama Boys Industrial School
Birmingham, AL
LEAA Grant No. 72A01R0335
Award Date - 04/10/74
Award Amount - $17,778

Purpose: To increase the capability of the ABIS educational program to provide individualized and integrated learning experiences for multiple-handicapped students (i.e., students exhibiting mental retardation, physical defects, emotional instability, or the effects of poor environment).

Content: The equipment, instructional materials, and other resources provided by this grant were used in classes which combined academic and vocational subject matter. In the course of administering this "career education" curriculum, more effective approaches for educating multiple-handicapped students were determined.

Expand and Improve Diagnostic Services Available to the Juvenile Court
Mercer County
Trenton, NJ
LEAA Grant No. 72A34R0037
Award Date - 08/25/72
Award Amount - $28,985

Purpose: To provide the personnel necessary to keep pace with a caseload that had been increasing since 1970, when the Diagnostic Services Unit was originally established.

Content: The Diagnostic Services Unit, consisting of a psychologist, a disabilities specialist, and a psychiatrist provided diagnosis and when indicated, therapy to children held in detention pending juvenile court sentencing.

Diagnostic Research and Planning Team
Union County Board of Chosen Freeholders
Elizabeth, NJ
LEAA Grant No. 72A34R0097
Award Date - 01/02/ 73
Award Amount - $37,624

Purpose: To provide diagnostic and related services to juveniles in detention and to provide comprehensive reports to the court.

Content: The team included a psychiatrist, a psychologist, a learning disabilities specialists, and a part-time social worker. During 1971, the social worker interviewed all 1,100 residents of the detention center and made referrals to 16 agencies in the community. When indicated, the learning disabilities specialist conducted individual sessions. In addition, two qualified teachers provided remedial education in small groups.

Alternative Schooling for Probationary Youth
City of New York
New York, NY
LEAA Grant No. 72A36R1156
Award Date - 06/01/72
Award Amount - $173,524

Purpose: To establish a special elementary school for students diagnosed as emotionally disturbed and/or having a serious learning handicap.

Content: The school curriculum was structured around each child's individual patterns of behavior and levels of function. A remedial and/or corrective reading program was available to each child requiring such treatment.

Engineered Classroom Technique for Adjudicated Delinquents with Measurable Learning Disabilities
North Carolina Office of Youth Development
Raleigh, NC
LEAA Grant No. 72A37R0451
Award Date - 09/15/72
Award Amount - $39,348

The GMIS summary was too truncated to be abstracted in the usual fashion. The essence of the summary is presented below.

The Project involved: (1) development of a project rationale; (2) a workshop on learning disabilities in delinquents and techniques for the engineered classroom; (3) screening and identification of students; (4) beginning of engineered classroom instruction; (5) post-testing of experimental and control groups.

1 9 7 3

District Guidance Center
City of Huntington Beach
Huntington Beach, CA
LEAA Grant No. 73A06R0077
Award Date - 12/07/73
Award Amount - $28,296

Purpose: To serve troubled youth and reduce the rate of delinquency by coordinating the activities of traditionally autonomous public and private youth service agencies.

Content: Close working relationships were developed between public schools, mental health and abuse clinics, youth employment centers, juvenile halls, police and probation departments, and other similar agencies. Individual programs of treatment were prescribed for the center's clients once they had been interviewed, screened, and tested. Team members participating in the diagnostic-prescriptive process included a psychologist/coordinator, a teacher competent in the remediation of learning disabilities, and selected guidance and behavioral change specialists.

Learning Disabilities Project
Department of Institutions
Denver, CO
LEAA Grant No. 73A08R0167
Award Date - 04/26/74
Award Amount - $115,000

Purpose: To plan, implement, and evaluate a comprehensive program for diagnosing and treating the learning handicaps of adjudicated delinquents or children in need of supervision.

Content: Once identified, the learning disabled children were treated by specially trained staff members. Treatment methodologies were aimed at correcting the disabilities whenever possible. When the problem was too severe to be corrected, adaptive behavior was stressed.

Parent Delinquent Education Program
Civil City of Each Chicago
East Chicago, IN
LEAA Grant No. 73A18R0073
Award Date - 06/29/73
Award Amount - $20,000

Purpose: To modify behavior interfering with home and social adjustment and with learning in the classroom and to change the attitudes of those students who regarded school in an especially negative light.

Content: Children were placed in an academic remediation program that focused on physical treatment. In addition, tutoring was provided to those students who did not possess the basic skills necessary for normal progress within their class placement.

Project Door: Tutorial Center
Project Door, Inc.
St. Louis, MO
LEAA Grant No. 73A29R0088
Award Date - 03/23/73
Award Amount - $18,000

Purpose: To meet the educational needs of children who have had contact with the juvenile court and who were either profoundly truant or had been suspended from the school system.

Content: A year-round day school program was provided for up to 25 delinquents. A curriculum designed to remediate educational handicaps was delivered to the students on an individual basis.

Learning Disabilities Teacher
Clay County Juvenile Justice Center
Liberty, MO
LEAA Grant No. 73A29R0504
Award Date - 04/02/73
Award Amount - $6,375

Purpose: To provide the juvenile court and any subsequent involved schools with an educational analysis of all detained juveniles.

Content: A learning disabilities specialist surveyed all detained juveniles with regard to the individual child's past, present, and future educational status. On the basis of these assessments, individual courses of treatment were prescribed for the juveniles. In addition, a specialized learning setting and a certified learning disabilities teacher were available to any child requiring such attention.

Diagnostic Evaluation Team to Service the Juvenile Justice System
Atlantic County
Atlantic City, NJ
LEAA Grant No. 73A34R0030
Award Date - 08/01/73
Award Amount - $46,900

Purpose: To provide the juvenile court with diagnostic evaluations of detained juveniles and other youngsters of interest to the court.

Content: The diagnostic evaluation team included a psychologist, social worker, learning disabilities specialist, and a part-time psychiatrist. The project was located in the county detention home.

1974

Pre-Delinquent and Delinquent Identification and Planning
Hillsborough County
Tampa, FL
LEAA Grant No. 74A12R0018
Award Date - 07/26/74
Award Amount - $128,000
Contact - Mr. Paul Rich
(813) 228-8666

Purpose: To provide an evaluation and treatment center to meet the needs of youth who evidence maladaptive attitudes and behavior within the school environment and community.

Content: Youth are referred to the center by classroom teachers, school psychologists, and principals. All youth referred to the center come from a complex of 22 junior high schools and 85 elementary schools. The center supplements the youth's regular school program. Once a youth is referred to the center, the staff, composed of educational diagnosticians, psychologists, and teacher's aides, administers a full battery of tests. LDs are actively looked for in all youth. Of the 90 youth at the center, 22 have been diagnosed as having LDs. Youth receive 5 hours of individualized remediation a week.

Comprehensive Community Based Treatment Program for Delinquent/Pre-Delinquent Youth
Hillsborough County
Tampa, FL
LEAA Grant No. 74A12R0166
Award Date - 04/14/74
Award Amount - $89,000
Contact - Ms. Tish Elsten
(813) 272-5765

Purpose: To provide a residential diagnostic and therapeutic unit for multi-problem children between the ages of 8 and 14.

Content: Youth are referred to the program by schools, youth service agencies, families, and courts, on the basis of severe behavior disorders. Most youth have had prior encounters with the criminal justice system. Upon entry into the program, all youth are involved in the diagnostic phase, which provides a complete evaluation (i.e. physical, psychological, psychiatric, academic and neurological). LDs are actively looked for during the diagnostic phase. The percent of youth having LDs is unknown. Resources for treating LDs are not available through the program, therefore referrals are made to outside agencies, with a prescription for treatment. Follow-up delinquency prevention services are provided in addition to parent counseling when needed.

Regional Juvenile Corrections Project
St. Josephs Probate Court
South Bend, IN
LEAA Grant. No. 74A18R0550
Award Date - 12/09/74
Award Amount - $208,000
Contact - Ms. Sandy Cohen, Coordinator
Mr. Richard Kiekbusch, Director
(219) 288-0661

Purpose: To provide assistance to local juvenile courts in addressing the needs for improved pre-dispositional diagnostic evaluations and post-dispositional treatment alternatives.

Content: The project provides an extensive array of evaluative services (i.e. psychological, psychiatric, medical, dental, academic, and vocational tests). Throughout the evaluative process, LDs are looked for in the youth. At the present, no LDs have been discovered. In terms of treatment, the program provides 2 group home residential settings, each having 9 youth. Youth attend local public schools with additional remedial tutoring done at the home. Treatment services are provided by a staff of special education teachers. The group home staff lacks skills and materials for the treatment of LDs. The program lacks funds to refer LD youth to qualified specialists.

Marion County Juvenile Housing Program
Office of Youth Development
Indianapolis, IN
LEAA Grant No. 74E18R0573
Award Date - 08/05/74
Award Amount - $20,000
Contact - Mr. Don Cashen & Mr. Tony Beumer
(317) 633-3830

Purpose: To provide remedial education and counseling in a group home setting for youths, 11-17 years of age, who are either chronically delinquent or educationally handicapped.

Content: Only one of the group homes, Happy House, has the facilities and staff requisite to treating LDs. Happy House employs an educational consultant and a psychometrist. No testing is done since all youth have been previously tested by the courts.

Marion County Remedial Reading and Pre-vocational Counseling Project
Marion County Juvenile Court and Center
Indianapolis, IN
LEAA Grant. No. 74A18R1094
Award Date - 05/05/74
Award Amount - $42,000
Contact - Ms. Susan Swabb & Mr. Paul Aleksic
(317) 926-4175 (317) 924-4841, ext. 269

Purpose: To ameliorate reading disabilities, academic failure, and unemployment as contributors to juvenile crime.

Content: At the present time, 28 adjudicated delinquents between 9 and 18 years of age are provided with an individualized daily program of instruction and/or job preparatory training. The program staff includes a special education instructor and volunteer tutors. Upon entry into the program, all youth are given a series of diagnostic tests (i.e. academic, psychological and vocational). Very little LD diagnostic testing is done, due to a lack of funds. Program personnel acknowledge a definite correlation between LD and JD, and plan to expand into LD testing and treatment soon.

School Delinquency Prevention Demonstration
McCraken County
Paducah, KY
LEAA Grant No. 74A21R0045
Award Date - 07/10/74
Award Amount - $40,500
Contact - Mr. Mike Lawrence
Director
(502) 443-7594

Purpose: To provide a coordinated and comprehensive local approach to the prevention of juvenile delinquency through the development of a non-residential counseling and educational center.

Content: Youth are referred to the program by the schools, juvenile courts and local mental health center. Approximately 75 percent to 80 percent of the youth have had an encounter with the criminal justice system, usually due to chronic truancy or severe behavior problems. Once a youth arrives at the program, he has already been tested by the schools for special education and LD problems. Roughly 25 percent to 30 percent exhibit a LD problem. The treatment component of the program lasts between 9 weeks to 6 months, at which point the youth returns to the regular school system. Treatment is provided on the premises by a certified special education teacher (25 students to 1 teacher). It is estimated that 2 out of 25 youth end up in the courts again.

Alternate School Program
City of Owensboro
Owensboro, KY
LEAA Grant No. 74A21R0074
Award Date - 09/13/74
Award Amount - $55,000
Contact - Mr. Sublet
(502) 685-5626

Purpose: To provide short-term developmental/educational experiences within an alternative school setting for youth, ages 12-18, who display chronic behavior problems.

Content: Once a youth has been referred to the Program, a personalized plan to alleviate the youth's personal, social and educational weaknesses is developed and carried out by a staff of certified special education teachers. Youth have usually been fully tested by the referral agency prior to their entry into the program. Referrals are made by schools (city, county and parochial), courts, the health department, and the bureau of human resources. Of the 45 students presently enrolled in the program, approximately 75 percent are educationally handicapped due to either LD or emotional disorders. Sixty percent of the youth are adjudicated delinquents.

Alternative Curriculum Program
Franklin County
Frankfort, KY
LEAA Grant No. 74A21R0084
Award Date - 09/13/74
Award Amount - $41,000
Contact - Ms. Leslie Cromer

Purpose: To provide counseling and tutoring to pre-delinquent and delinquent youth, thereby increasing academic achievement levels and reducing the drop-out and truancy rates.

Content: In school delinquency treatment programs presently being run at two local junior high schools, approximately 50 percent of referrals to the program are made by the courts, in addition to referrals from schools, community organizations and self-referrals.

Once a youth is admitted to the program, reading and math tests are administered if they have not already been given by the school. If test scores indicate a handicap, the California Personality Test and tests for LDs are administered. Approximately 30 percent of the program youth have LDs.

Once a LD is diagnosed in a youth, he is referred to a LD teacher in the school system for individualized instruction. In such cases, the Alternative Curriculum Program may still continue to provide counseling.

Minnesota Youth Advocate Corps
City of Saint Paul
St. Paul, MN
LEAA Grant No. 74A27R0049
Award Date - 09/01/74
Award Amount - $75,000 (no longer LEAA funded)
Contact - Mr. Daley
(612) 298-5864

Purpose: To provide an auxiliary service group to arrange and coordinate alternative educational experiences for probationary, post-institutionalized, and pre-delinquent youth.

Content: Youth Advocate Corps is composed of eight full-time professionals from varied fields, (i.e., psychology, social work, languages, and teaching). The primary responsibility of the advocate is to supervise the educational and social development of program youth. The advocate works with school staff to create a climate which will assure continued education for the student. All program youth are referred by the courts, and most are on probation. Once a youth enters into the program, he is given a full range of tests including an educational evaluation. If a LD is apparent, the youth is then referred to a special learning teacher in the school system. Approximately 10 percent of program youth are diagnosed as learning disabled.

Area Detention Services
Clay County Juvenile Justice Center
Liberty, MO
LEAA Grant No. 74A29R0101
Award Date - 03/18/74
Award Amount - $23,820
Contact - Ms. Mary Kay Stenger
(816) 781-6901

Purpose: To provide a short-term detention center for youth who are awaiting court hearings as an alternative to placing them in the county jail.

Content: The primary goal of the center is to increase the learning abilities of the youth in detention. A full battery of tests is administered to the youth upon arrival. A specialized classroom and LD teacher actively seeks out LDs in the youth. Because the average length of detention is only six days, LDs cannot be treated on the premises. Once a LD youth has left the program, the staff prescribe necessary treatment and do follow-up studies.

Juvenile Attention Center- Educational Counselor
Cole County
Jefferson City, MO
LEAA Grant No. 74A29R0518
Award Date - 03/17/74
Award Amount - $10,000
Contact - Mr. Donald Klien

Purpose: To provide a non-residential, multi-service diagnostic and treatment center to keep delinquents in school or in alternative learning situations.

Content: Upon entry into the program, all youth, ages 11 to 17, are given a full battery of educational tests by a LD diagnostician. Approximately 25-30 percent have a LD. Most youth are referred by the courts, in addition to referrals by parents and schools. The most common criteria for referral are behavioral disorders and chronic truancy.

Once a youth has been diagnosed as learning disabled, he is referred to one of two local Universities or to the Mid-Missouri Mental Health Center for treatment. The program began in September 1975.

Archway Children's Residential Treatment Center
Camden County Board of Freeholders
Camden, NJ
LEAA Grant No. 74A34R0153
Award Date - 12/04/74
Award Amount - $100,000
Contact - Mr. John Galiagher
(609) 767-5757 ext. 228

Purpose: To provide a residential treatment center for adolescent boys who are either socially maladjusted, emotionally disturbed, or neurologically impaired.

Content: The Center offers each youth an individualized learning and recreation program. Each program of instruction is developed and implemented by a staff consisting of a LD specialist, psychologists, a speech therapist, an audiologist, social workers, nurses, and doctors. All program youth are first administered a full range of tests, including LD diagnostic evaluations. When a LD is discovered, program staff are able to treat the youngster on the premises. The percent of youth diagnosed as learning disabled could not be estimated. The average length of stay in the program is 2 years, then the youth is returned to the school system.

Jersey City Juvenile Diversion Project
Jersey City
Jersey City, NJ
LEAA Grant No. 74A34R0221
Award Date - 05/15/74
Award Amount - $175,000
Contact - Mr. Raymond Aumack
(201) 451-2869

Purpose: To provide an alternative school setting for youth ages 12-16, in which their educational skills are developed to the extent that they may function successfully in a regular school system, thereby lowering the drop-out rate,

Content: The majority of the Program participants are referred by the courts. Upon entry into the program, each youth is tested for reading and math skills by the staff psychologist. If a student's score indicates a handicap, further diagnostic measures are taken, including a neurological workup by a psychiatric consultant. If a LD is diagnosed, the student is referred to a local child-study team for treatment.

Yardville Learning Center and Communications Skills Program
Department of Institutions/Agencies - Division of Corrections and Parole
Trenton, NJ
LEAA Grant No. 74E34R0058
Award Date 06/14/74
Award Amount - $21,000
Contact - Mr. William Auto
(609) 298-6300 ext. 213

Purpose: To provide a comprehensive individualized educational diagnostic and treatment center for institutionalized youth and adults between the ages of 15 and 34.

Content: Youth are immediately tested for academic deficiencies upon entry into the program. LDs are actively looked for by a LD specialist on the staff. Once a LD has been identified, the LD specialist prescribes appropriate treatment. Treatment is provided by the Program's teaching staff which consists of four certified teachers and five teacher's aides. Of the Programs 60 students in 1975, 10 were diagnosed as learning disabled. As a delinquency prevention program, the Center has exhibited greatest success once students have reached the GED level.

Five Towns Youth Services 3
Nassau County
Mineola, NY
LEAA Grant No. 74A36R0185
Award Date - 04/25/74
Award Amount - $106,000
Contact - Ms. Maddy Mayor
(516) 239-6244

Purpose: To provide comprehensive educational, psychological, and pre-vocational services to pre-delinquent and delinquent youth.

Content: The program operates as a full-time alternative education program for court referred youth and their families. Upon admittance to the program, all youth are administered a complete battery of educational and psychological tests. If it is determined that a youth has a LD, further testing is conducted by a LD teacher and then returned to the regular school system which provides special LD classes. Approximately 20 percent of the youth are diagnosed as learning disabled.

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Huntsville Delinquency Prevention Center
City of Huntsville
Huntsville, AL
LEAA Grant No. 75A01R0110
Award Date - 05/14/75
Award Amount - $30,000
Contact - Mrs. Mary Jane Caylor, Director of Special Education
(205) 539-2111

Purpose: To alleviate delinquency within the Huntsville School System through provision of a "focused educational environment" to those youth on the verge of being expelled by the Board of Education.

Content: Youth are referred to the program by the Board of Education on the basis of severe discipline problems which would normally prompt immediate expulsion. A full battery of psychological and educational tests is administered at the intake phase, and individual programs are designed to meet each youth's specific needs. LDs are actively looked for and, when detected, are treated with visual and auditory materials and equipment. Before the program began, an average of 35 students were expelled each year from the Huntsville School System. In 1975, only one youth was expelled. The program handled 32 cases in 1975.

Juvenile Crisis and Diagnostic Center
Logan County
Sterling, CO
LEAA Grant No. 75A08R0032
Award Date - 05/30/75
Award Amount - $12,000
Contact - Mr. Jim Simpson, Director
(303) 522-4392

Purpose: To reduce the rate of recidivism among juvenile offenders in the six northeast counties of the state by providing residential facilities, counseling services, diagnostic evaluations, and educational programs to both pre- and post-adjudicated juveniles.

Content: The Center is staffed with houseparents, three volunteers, and the personnel in a local mental health clinic. The program can serve 10 juveniles at any one time, and their stay varies from 24 hours to 30 days. Included in the diagnostic services is an educational evaluation capable of detecting LDs. (The test battery consists of the WISC, a Visual Motor Integration Test, and reading achievement tests.) Youth identified as having LDs are referred back to their respective schools, which have special education components, or to a private physician. If the juvenile is a court referral, the court is made aware of his condition and recommendations regarding future treatment are made. In 1975, 80 juveniles passed through the Center. Using a broad definition of LD (i.e., taking social and emotional factors into account as well as neurological ones) 80 percent had LDs.

Computer Assisted Instruction
Hillsborough County
Tampa, FL
LEAA Grant No. 75A12R0275
Award Date - 08/27/75
Award Amount - $15,000
Contact - Dr. Harold Edwards, Staff Psychologist
(813) 961-1242

Purpose: To define and reduce emotional, social, and academic dysfunctioning to the degree that the student can return to the mainstream of community-home-school life on a full-time basis.

Content: Actually, computer assisted instruction is only one component of the Lake Magdalene Home, which, in turn, is under the Children's Service Center. The Home, which is not a detention facility, accepts referrals from schools, the Division of Family Services, and the Division of Youth Services. On occasion, however, adjudicated delinquents are also dealt with. A full evaluation of entrants is conducted, including the type of educational testing which would detect LDs. The Dorothy Thomas School on the Lake Magdalene campus is devoted solely to the remediation of LDs. The school is run under the auspices of the Hillsborough County School System. The program can handle 108 youth at any one time, with 16 in residence.

School Delinquency Program
Evansville-Vanderburgh School Corp.
Evansville, IN
LEAA Grant No. 75A18R0204
Award Date - 08/1/75
Award Amount - $56,000
Contact - Messrs. Jim Trader & Carl Hendrickson
(812) 426-5052

Purpose: To establish a program for junior and senior high school students who exhibit serious behavior and attitude problems in the hope that these students can be diverted from involvement with the juvenile justice system.

Content: A student exhibiting problems is first seen by the Special Concerns Counselor at his school. At the discretion of the counselor, he may then be referred to one of the Program's intern psychologists for testing. The test battery includes basic perceptual tests capable of detecting LDs. If the psychologist suspects an LD, the student would then be referred to a private physician for diagnosis. (Note: In Indiana, a youth must be diagnosed as having a LD by a physician before he can be placed in a LD classroom.) Very few of the problems seen by the Program are attributable to neurological impairment. Apparently, such problems are usually detected at the elementary-school level. Since the beginning of the 1975-76 school year, the intern psychologist has seen 100 new cases. It is estimated that during the 1974-75 school year, 83% of the students taking part in the program were diverted from involvement with the juvenile justice system.

School Delinquent Program
Civil City of East Chicago
East Chicago, IN
LEAA Grant No. 75A18R0206
Award Date - 03/25/75
Award Amount - $15,000
Contact - Mr. Johnson, Youth Service Bureau
(219) 397-4200

Purpose: To reduce the number of suspensions and expulsions and to assist parents or guardians in establishing and maintaining a constructive and guiding relationship with their teenage children.

Content: The Program is administered by the Youth Service Bureau. Schools refer delinquent students to the juvenile court which, in turn, sends status offenders to the YSB in lieu of disposition. Additionally, the YSB accepts referrals directly from the schools, if students and parents are willing. LD screening is performed for the YSB as a matter of course by the Tri-City Community Mental Health Center. As the YSB provides only counseling, it is not involved in LD remediation. Rather, LDs are referred back to the East Chicago schools, which run LD remediation programs. The Program can handle 10 cases at any one time. It is estimated that 1 out of 10 students has a LD.

Extension and Improvement of Probation Services
Vigo County Circuit Court
Terre Haute, IN
LEAA Grant No. 75A18R0437
Award Date - 05/08/75
Award Amount - $13,000
Contact - Mr. John Sedletzeck
(812) 877-2415

Purpose: To identify those delinquents who have LDs and then prescribe and carry out remedial programs for them.

Content: The project serves junior high school students who have already had minor run-ins with the juvenile justice system and who, for the most part, come from economically and academically deprived homes. The diagnosis of LD rests on reports from school psychologists, consultations with parents, and the results of a questionnaire designed by an Indiana State University consultant to indicate students having LDs. Remediation is provided to the delinquents by volunteers on a one-to-one basis. Special equipment and excercises are also available. At present, 14 students are enrolled in the program, which began in July of 1975. Thus far, approximately 25 volunteers have been trained in remediation techniques by the 3 full-time staff members.

Pre-sentence Diagnostic Services
Delaware County Circuit Court
Muncie, IN
LEAA Grant No. 75A18R0504
Award Date - 08/06/75
Award Amount - $31,000
Contact - Dr. Donald Hendrickson, Head of Regional Diagnostic and Evaluation Center
(317) 747-4577

Purpose: To continue the services of the Regional Diagnostic and Evaluation Center, which provides diagnostic services to the juvenile courts of Region IV.

Content: The Center conducts pre-sentencing evaluations of court referrals from 12 counties. Screening for visual and auditory defects (e.g., Phonetic Aperception Test) is carried out as a matter of course. Youths who exhibit a LD are referred to a private physician for a neurological work-up. According to Hendrickson, less then 5 percent of the youth seen at the Center test positive for a LD. In addition to the LD screening, a psychological test battery is administered to the juveniles, and social histories are taken. On the basis of this information, the Center makes specific recommendations to the courts regarding the future disposition of the youth.

Comprehensive Evaluation for District Court Referrals
Montgomery County
Rockville, MD
LEAA Grant No. 75A24R0008
Award Date - 04/16/75
Award Amount - $111,000
Contact - Dr. Phelps
(301) 869-6303

Purpose: To provide an evaluation of, and recommendations regarding, all juveniles referred by the Department of Juvenile Services staff or district court judges.

Content: The project serves youth of all ages, but the majority of referrals are adolescents. The youth are given a full battery of tests, which includes an educational component capable of detecting LDs. Once a LD has been diagnosed, the juvenile is referred to the Montgomery County school system for remediation (e.g., tutoring and participation in special education programs). Evaluation services are provided for approximately 500 youth per year. The program employs two full-time education specialists.

The Group School Education and Advocacy Program
County of Middlesex
Cambridge, MA
LEAA Grant No. 75A25R0021
Award Date - 12/20/74
Award Amount - $76,000
Contact - Susan Claw, Teacher and College Counselor
(617) 491-4884

Purpose: To divert a limited number of youth who have been involved in the criminal justice system into the Group School's educational component and, through the advocacy component, to diminish the likelihood of other low-income youth becoming delinquent.

Content: The school deals with junior and senior high school students referred by the juvenile court. At the intake phase, students are given math and reading achievement tests, neither of which are designed to identify LDs. It occasionally happens, however, that students identified as having LDs by the court clinic are referred to the Group School for remediation. In these cases, remediation is based on tutoring. If the LD is too severe to be treated in this manner, the student would likely be referred to the special education tutor of the Cambridge Public Schools for more extensive testing and treatment. The Group School currently serves 15 youth.

Transitional School
Bay City School District
Bay City, MI
LEAA Grant No. 75A26R0084
Award Date - 09/27/74
Award Amount - $63,000
Contact - Ms. Laurie Mahon
(517) 686-6780

Purpose: To reduce both the dropout rate in Bay City schools and the arrest rate of project youth through alleviation of the students' social and academic problems.

Content: The program concentrates on individual academic problems but does not actively screen for LDs. When an obvious LD is encountered, Transitional School teachers attempt to remediate the problem through tutoring. The school does not maintain special equipment or materials for treating LD, and project personnel see no correlation between LD and JD. The full-time school staff consists of the project director, three teachers, and three teacher's aides.

Diagnostic Evaluation Social Services
MS Department of Youth Services
Jackson, MS
LEAA Grant No. 75A28M0037
Award Date - 08/08/75
Award Amount - $135,000
Contact - Mr. Parker, Administrative Assistant to the Director
(609) 354-6512

Purpose: To provide comprehensive evaluation services and short-term intensive treatment (including detention in a facility exclusively for children) to delinquent youth.

Content: The program deals exclusively with court referrals, both pre- and post-disposition. The type of educational testing that would detect a LD is contracted out to a firm of psychologists. While the program attempts to remediate generalized learning problems, it has neither the equipment nor staff to deal with neurological impairments. In such cases, the youth are referred to other state agencies (e.g., a mental health facility or clinic). Of the 700 youths seen in the course of a year, 3 percent to 5 percent are diagnosed as having neurological impairment.

Providence Educational Center
Providence Programs, Inc.
St. Louis, MO
LEAA Grant No. 75A29R0118
Award Date - 04/14/75
Award Amount - $94,000
Contact - Ms. Brown (314) 535-3821 & Mr. Joseph Ryan (314) 652-5866

Purpose: To provide an educationally oriented resocialization program for juvenile offenders referred to the juvenile court for burglary and other stranger-to-stranger crimes.

Content: All youth involved in the program are tested during intake for: 1) reading, writing, and math deficiencies; 2) vocational preferences; 3) LDs caused by organic dysfunctions. It is estimated that more than 55 percent of the youth have LDs. In most cases, the primary sympton is a reading level that is inconsistent with the IQ. With regard to LD remediation, Ms. Brown complained that there are too few LD teaching materials on the market. Therefore, staff at the Center often must create their own materials. The Center's remediation program emphasizes moving a youth from skill to skill, rather than from grade to grade. The program has a capacity of 60 students; 46 are currently enrolled. Students entering the program are usually between 13 and 15 years old.

De La Salle Education Center
De La Salle Education Center
Kansas City, MO
LEAA Grant No. 75A29R0192
Award Date - 01/08/75
Award Amount - $75,000
Contact - Mr. Godfrey S. Kobets
(816) 221-1389

Purpose: To increase the number of high school graduates and to provide job skills and vocational guidance to youths who have taken some first steps toward juvenile delinquency and crime.

Content: The project is a community-based education/training center for pre-delinquent youths. De La Salle is certified to grant high school diplomas. While the program is primarily concerned with social problems in the educational setting, all students are tested for LDs. It is estimated that 31 percent of De La Salle students have LDs. Remediation is carried out by LD specialists on the Center's staff. Mr. Kobets believes that a strong correlation exists between LD and JD. Since 1974, in fact, the Center has been intervening in a few select elementary schools in an attempt to identify LD problems early in the educational process.

Redirect
Southeast Jackson County Mental Health Center
Lee's Summit, MO
LEAA Grant No. 75A29R0246
Award Date - 01/02/75
Award Amount - $40,000
Contact - Mr. John Wubbenhorst
(816) 524-7300

Purpose: To provide an alternative to the established educational system for youth who do not fit the traditional modes of classroom instruction, thereby diverting the youth into more positive lifestyles.

Content: The program deals primarily with walk-ins and school referrals, although a few court referrals are accepted. Upon admittance to the program, a student is given a number of vocational and educational tests (e.g., Illinois TPA, Wechsler, WAT). Once a LD has been identified, it is remediated in one of two ways. If the problem is perceptual in nature, specialists on the Redirect staff deal with the problem. In the case of auditory dysfunctioning, however, the student is referred to the OT therapist at a local health center for further assistance. Approximately 40 percent of Redirect's students have LDs. Wubbenhorst recognizes a correlation between LD and JD.

Woodbridge Action for Youth (WAY)
Township of Woodbridge
Woodbridge, NJ
LEAA Grant No. 75A34R0029
Award Date - 03/19/75
Award Amount - $55,000
Contact - Mr. James Kilroy, Director
(201) 574-0900

Purpose: To provide drug and alcohol treatment services that result in the client's return to school or in his attainment of a General Equivalency Diploma.

Content: WAY accepts referrals from courts (both pre- and post-disposition), schools, and youth agencies. WAY does not undertake any diagnostic work, as most of the youth have been evaluated before they enter the program. Youth with LDs are accepted; it is estimated, in fact, that 25 percent of WAY's clients are so afflicted. Whenever possible, LDs are remediated through tutoring. However, if a problem is too severe to be treated in this fashion, the youth is referred back to the school system for remediation. In 1975, WAY handled 50 cases, but no more than 15 at any one time.

Probation Reading Clinic 3
City of New York
New York, NY
LEAA Grant No. 75A36R0002
Award Date - 04/25/75
Award Amount - $286,000
Contact - Ms. Margaret Donovan
(212) 990-5655

Purpose: To continue and expand the Probation Department's remedial education and supportive counseling services to 225 probationers between the ages of 10 and 16 from the Borough of Queens.

Content: All participating probationers are given psychological, intelligence and diagnostic reading tests. LDs are actively looked for, but, once identified, the youth suffering from a perceptual disorder is not isolated from the others. After being sent to an optometrist for a thorough eye check and, if needed, to a psychologists for further diagnosis, the youth returns to the program for individualized reading instruction. It is estimated that at least 50% of the probationers have LDs, and Donovan acknowledges a correlation between LD and JD.

Richmond Reading Clinic 2
City of New York
New York, NY
LEAA Grant No. 75A36R0021
Award Date - 06/27/75
Award Amount - $150,000
Contact - Mr. Tom Lamanna, Probation Officer
(212) 720-3242

Purpose: To continue and expand a reading center program of remedial education and counseling for Staten Island youth who have become involved with the juvenile or criminal court system.

Content: The Clinic serves court referrals between the ages of 13 and 18, most of whom are on probation. During intake, the youth are given standard reading achievement tests (e.g., California and Metropolitan) as well as a special diagnostic test designed to determine individual weaknesses. Probationers suspected of having LDs are referred to a LD remediation program at Staten Island's Wagner College, which is run in conjunction with Richmond College and the Staten Island Board of Education. Of the 200 youth seen in the course of an average year, approximately 10 percent are referred to the Wagner LD program. Lamanna sees a LD/JD link using a broad definition of LD. Indeed, he would tend to stress the emotional and social aspects of the problem.

Department of Correction Remedial Language Development Two
City of New York
New York, NY
LEAA Grant No. 75A36R0042
Award Date - 04/25/75
Award Amount - $131,000
Contact - Dr. Sperber, Director of Program
(212) 726-5700

Purpose: To teach reading skills to adult and adolescent detainees or inmates of Riker's Island who are illiterate or functioning at a reading level below the fourth grade.

Content: The program's adolescent component is aimed at taking zero readers between the ages of 16 and 21 up to a 5.5 grade level. Upon entering the program, participants undergo both "formal" and "informal" screening. The former, consisting of the Adult Basic Learning Exam, is necessary to fulfill Federal and state requirements. The latter (e.g. Random House High Intensity Learning System) is carried out to provide program workers with more information. Once a youth's reading level has been determined, his specific needs are assessed. When a youth is suspected of having a LD, there are virtually no special treatment alternatives open to the program staff. Problems of finance and logistics prohibit the referrals of juveniles to a physician for a neurological work-up, and the medical facilities at Riker's are not equipped to deal with such a problem. Sperber, however, does not believe that greater diagnostic capabilities would improve the reading program. Program

participants currently average a 2.2 level gain with 60 hours of instruction, using a strictly behavioral approach. The program serves approximately 340 youth per year.

Elmcrest Children's Center
City of Syracuse
Syracuse, NY
LEAA Grant No. 75A36R0053
Award Date - 04/25/75
Award Amount - $100,000
Contact - Dr. Barry Glick
(315) 446-6250

Purpose: To establish a day treatment program for adolescent and pre-adolescent girls who are able to live at home if provided with intensive educational, psychological, and recreational services.

Content: The Center serves girls between the ages of 7 and 17, all of whom are school referrals. Students are referred to the program on the basis of disciplinary or academic problems. All girls are evaluated educationally and psychologically. The screening is sufficiently detailed to detect LDs. A girl having a LD is kept at the Center, and remediation through tutoring is carried out by staff.

Rheedland Truancy Program
City of New York
New York, NY
LEAA Grant No. 75A36R0077
Award Date - 06/27/75
Award Amount - $138,000
Contact - Mr. Richard Murphy, Project Director
(212) 929-8630

Purpose: To provide intensive assistance to a maximum of 100 children with the goal of their returning to, and remaining in, school.

Content: The Project, administered by the Rheedland Foundation, Inc., deals with children between the ages of 8 and 11 referred by schools in the upper west-side School District #3. Upon entering the Program, a child is given: 1) an eye exam (more than 50 percent need treatment); 2) a general physical (this will eventually include auditory tests); 3) reading tests; 4) psychological tests; 5) a neurological work-up, if the psychologist deems it advisable. All children, whether or not they have LDs, are tutored on a one-to-one basis. The project staff consists of five full-time professionals trained in psychology and sociology, part-time specialists, and volunteers from the neighborhood. Murphy recognizes a correlation between LD and JD and feels that an effort should be made to treat LDs prior to adolescence.

Individualized Instruction to Meet Student Needs
Department of Human Resources
Raleigh, NC
LEAA Grant No. 75A37R0180
Award Date - 09/12/75
Award Amount - $100,000
Contact - Ms. Mildred Spencer
(919) 829-3011

Purpose: To provide individualized instruction for adjudicated delinquents on a state-wide basis.

Content: Upon entry into the program, all youth undergo full psychological and educational evaluations. While the testing is capable of detecting LDs, in terms of remediation only the speech and hearing component has been developed to any extent. Juveniles remain in the program an average of 7-8 months. Ms. Spencer acknowledges a high correlation between LD and JD.

Project to Extend and Improve the Clinic of Diagnostics and Treatment
Administracion De Los Tribunales
Hato Rey, PR
LEAA Grant No. 75A72R0005
Award Date - 02/06/75
Award Amount - $90,000
Contact - Mr. Enrique Ridera
(809) 763-3690

Purpose: To improve the services of the Clinic of Diagnostics and Treatment of the Superior Court.

Content: The Clinic provides the court with psychological, psychiatric, and neurological evaluations of the referred delinquents. LDs would, of course, be detected during the neurological work-up, which is administered on the basis of social histories compiled for each youth. Once a delinquent has been diagnosed as having a LD, he is referred out for remediation.

Character Education Delinquency Prevention
Missouri Department of Elementary and Secondary Education
Jefferson City, MO
LEAA Grant No. 75E29R0236
Award Date - 04/22/75
Award Amount - $100,000
Contact - Mr. Keith Schaffer
(314) 751-4212

Purpose: To develop alternative education programs in two school districts geared toward dealing with the psychological, emotional, attitudinal, and physical problems of the high-risk child.

Content: The program's main emphasis is on the amelioration of social and emotional problems. Students are screened, however, for LDs: students are given a battery of educational tests, and teachers compile a behavior rating scale for each youth. When a child is diagnosed as having a LD, he is referred to a trained LD teacher in the school system. The two programs each handle between 50 and 100 students a year.

* * * * *

In addition to the LEAA-sponsored projects abstracted above, three Colorado programs are cited in the text (p. 70). Abstracts of these programs follow.

Project New Pride
Denver, CO
Contact - Mr. Thomas James, Director
(303) 320-4631

The New Pride Project is a community-based intensive supervision project serving approximately sixty probationers. The project, which takes the form of a work-study program, serves as an alternative to institutionalization for juveniles, aged fourteen to seventeen, who have records of two or more prior adjudications of delinquency. The identification of learning handicaps, including learning disabilities, is a focal point of the diagnostic process. Remedial educational programs also are central to the rehabilitative services. A brief evaluation of Project New Pride was conducted by the MITRE Corporation as part of the national evaluation of LEAA's IMPACT Program. Its overall assessment was extremely positive, calling New Pride "a highly innovative community-based intensive supervision project, operating well outside the context of traditional probation practices."

Diagnostic Services of the Colorado Division of Youth Services
Denver, CO
Contact - Dr. Helen Hursch
(303) 986-2277

The Colorado Division of Youth Services operates one of the largest programs in the nation for diagnosis and treatment of learning disabled delinquents. After a youth has been committed by the state, he is tested for learning disabilities by diagnosticians employed at the Colorado Division of Youth Services. Diagnostic testing typically starts with visual and audiometric screening examinations that measure sensory input. If results of a recent general achievement test are not available, such a test is administered and the results, including a handwriting legibility analysis, serve as the basis for further

testing. If the youth does poorly on either the reading, spelling, or mathematics achievement subtest; or if the youth's handwritten test responses are found to be clumsy, semilegible, or poorly coordinated, further testing is conducted. Such testing might determine the youth's reading comprehension level, nonverbal intelligence, visual perception ability, auditory discrimination ability, visual memory, or visual motor integration ability. In addition to the testing procedures mentioned above, all students are given a speech screening to determine articulation problems. If such problems are found, an auditory discrimination test is administered. In addition, the speech screening picks up mumbly speech, stammering, stuttering, nasality, and voice problems. Based on test results, personal observation by the learning disability diagnostician, and recommendations of the Department of Youth Services' psychologist, an individualized rehabilitation program is developed for each youth. Rehabilitation goals are determined and progress toward those goals is periodically measured.

Lathrop Park Youth Camp
Walsenburg, CO
Contact - Dr. Richard C. Compton, now Executive Director of the Juvenile Services Section, Department of Social and Rehabilitative Services, Arkansas
(501) 371-2108

(Description of the program is taken from Compton, R. C., speech before the Symposium on the Relationship of Delinquency to Learning Disabilities Among Youth, Little Rock, Arkansas, December 1971, esp. pp. 9-19).

Lathrop Park is a residential facility operated by the Colorado Division of Youth Services for adjudicated delinquent boys at least 12 years of age, classified as I-3-cfm, with multiple learning disabilities. The remedial program stresses a contractual process whereby the child participates in the definition of his program and schedule for achievement. Highly individualized instructional approaches are used. Nontraditional approaches to education are also stressed. Progress is measured by indices relating to affective behaviors, intrapersonal capabilities, interpersonal capabilities, social-environmental capabilities, and economic capabilities. Compton reports that during the two years prior to his presentation (December 1974), no child who had completed the Lathrop Park program had been returned to an institution.

Appendix E.

ANNOTATED BIBLIOGRAPHY OF THE LITERATURE LINKING LD AND DELINQUENCY

A

Ardoff, D. G. *Recent trends in the reading levels of delinquent boys.* Unpublished paper, April 1972.

The role of reading retardation as a factor in juvenile delinquency was examined in a study which sought (1) to determine a correlation between retardation over a 5-year period and (2) to observe any changes which might have occurred in the relationship since a 1915 study. Boys committed to a St. Paul, Minnesota, boys' residential treatment center over a 5-year period from 1966 to 1971 were used as subjects. Interviews; intelligence, reading, arithmetic, and spelling tests; and personality inventories administered at the time of referral to the center provided data for analysis. The results indicated that reading grade levels of delinquents remained stable over the 5-year period and showed consistent retardation. Little change in the relationship between retardation and delinquency could be found since 1915. It was concluded that while retardation cannot be said to be a cause of delinquency, it is felt that remediation may be a factor in rehabilitating delinquents. Tables and references are included.

Bailey, E. J. *Academic activities for adolescents with learning disabilities.* Evergreen, Col.: Learning Pathways, Inc., 1975.

This book presents a collection of learning activities for children of all ages. The author's experience includes teaching remedial reading to institutionalized teenage boys whose reading abilities fell below 6th grade level. She draws a line between learning disabled and delinquent youth--"Perhaps if their learning disabilities had been diagnosed and treated earlier, they would not have had to prove themselves in deviant behavior." The book outlines skill building diagnostic techniques, and remedial activities for compensatory learning in the areas of auditory perception, visual perception, conceptualization and extended thinking, language extension, socialization, interneurosensory integration, and reading. The teacher in the special education or ordinary classroom is viewed as the key to providing these children with the special help they need. This volume is intended to serve as a guide to aid teachers in reaching that end.

Barnlett, R. H. Characteristics of the adolescent mentally retarded delinquents in Virginia's juvenile training facilities. *Training School Bulletin,* 1974, 71 (3), 157-163.

About 22 percent of the population of Virginia's training schools for juvenile delinquents, aged 14 to 19, can be classified as mentally retarded. The following statistics are noted: 44.1 percent of the institutionalized population were Black; 55.9 percent were White; the relationship between urban and center city environment and delinquency is high for those identified as mentally retarded in the facilities; of the mentally retarded population, the Black population in the training schools is in excess of 2.5 for each Black in the general population.

Bednar, R. L., Zelhart, P. F., Greathouse, L., & Weinberg, S. Operant conditioning principles in the treatment of learning and behavior problems with delinquent boys. *Journal of Counseling Psychology,* 1970, 17, 492-497.

In this study, 32 12-18 year old delinquent boys were given 18 consecutive weekly lessons of programed reading instruction. Subjects were randomly assigned either to a group reinforced with monetary tokens or to a group that was nonreinforced. Analysis of variance with repeated measures was employed to analyze the data. Results indicate that both groups showed significant improvement in reading skill from pre- to posttesting, but that the reinforced group showed significantly more improvement than the nonreinforced group. Teacher ratings of general classroom behavior showed concomitant improvement for the reinforced group. Results are discussed in the context of applying conditioning principles to learning problems and the role of the counseling psychologist as a consultant to teaching personnel.

Berman, A. *Delinquents are disabled: An innovative approach to the prevention and treatment of juvenile delinquency.* Final report of the Neuropsychology Diagnostic Laboratory at the Rhode Island Training Schools, December 1974.

In an attempt to investigate the occurrence of adaptive disabilities in delinquents, an experimental group of 45 males recently incarcerated at the Rhode Island Training School and a control group matched on age, race, and sex from a Providence inner-city high school were administered the Halstead Neuropsychological Battery for Adults. Significant differences emerged between the sample means on almost all of the Wechsler scales and on the majority of Halstead's tests, indicating that the delinquent group showed marked impairment in critical adaptive abilities. Moreover, discriminant analysis of the test protocols showed that the delinquents had a different pattern of abilities when compared with the controls. The author concludes that these results raise questions about the role of neurological factors in the etiology of delinquent behavior, that could be clarified by longitudinal studies. He offers suggestions for prevention and rehabilitation efforts concentrating on overcoming skill deficits.

Berman, A. Speech before the Symposium on the Relationship of Delinquency to Learning Disabilities Among Youth, Little Rock, Arkansas, December 1974.

Given the failure of traditional approaches to rehabilitating delinquents, Berman demands a change in attitudes toward delinquency so that the disabilities of youngsters are recognized. He cites the results of a 5 year study on a random population of new admissions to the Rhode Island Training School for Boys as proof of the incidence of learning disabilities among delinquents. Around 70 percent of the youngsters imprisoned had "measurable disabilities significant enough to warrant professional attention" and most of these had existed for some time. Finally, Berman describes a hypothetical cycle describing how learning disabilities and delinquency become linked. He concludes that it is nearly impossible to interrupt this cycle unless the following critical changes are made: (1) mandatory disability detection training for all teachers of grades K-3; (2) early diagnostic screening for LD in kindergarten and the first grade; (3) installation of diagnostic and remedial facilities in reformatories; and (4) teachers hired who demonstrate compassion and respect instead of degrees and fancy training.

Berman, A. Delinquents are disabled. In B. Kratoville (Ed.), *Youth in trouble*. Proceedings of a symposium, Dallas-Fort Worth Regional Airport, May 1974. San Rafael, Calif.: Academic Therapy Publications, 1974. Pp. 39-43.

In this presentation the author presents preliminary results from a five year study on the incidence of learning disabilities among new admissions to the Rhode Island Training School for Boys. The boys in the random sample and a control group in a regular school were inter-

viewed to obtain a detailed personal history and administered the entire Halstead-Reitan Neuropsychology Battery. The diagnostic data show that 70 percent of the incarcerated youth and 20 percent of the control group had measurable disabilities significant enough to warrant professional attention. The author concludes that "the project has demonstrated that failure to recognize significant disabilities early in a child's school career sets into motion a devastating series of events that, for a large number of unfortunates, ends up in a reformatory or juvenile court." He, therefore, recommends establishing diagnostic screening and disability correction programs in both kindergarten and in reformatories. See technical summary in Appendix C.

Berman, A. Neurological dysfunction in juvenile delinquents: Implications for early intervention. *Child Care Quarterly*, 1972, 1(4), 264-271.

Suggested is the possibility of undiagnosed neurological dysfunction in juvenile delinquents, and recommended is early identification and intervention of neurologically impaired children. It is reported that specific deficits found in delinquents are also found in children classified as learning disabled with earlier identification of the learning disabled thought to be the difference. Specialized treatment programs are said to be able to teach the impaired child self-regulatory behaviors in the common problem areas of hyperactivity, short attention span, visual/perceptual or visual/motor inefficiency, impulsivity and low frustration tolerance, irritability and aggressiveness, and lack of control and understanding.

Blakely, W. P. *An exploratory study of emotional responses related to reading*. Unpublished paper, Drake University, 1969.

The relationship of reading material to delinquent behavior has been a much discussed subject. This author has taken some steps toward identifying and understanding the emotional concomitants of reading. He investigated the perceptions of emotional concomitants which exist among a sizable and geographically diversified group of subjects presumed to be sensitive to phenomena of human development and learning, and/or verbal behavior. The subjects were 414 men and women enrolled in 11 colleges and universities in nine states. A constructed checklist asked each subject to indicate as "never," "rarely," "sometimes," or "often," his perception of the commonness of occurrence of certain emotional responses during reading. The checklist was divided into four sections: subjective experiences of emotion, involuntary physiological responses, overt action, and incentive reduction. It was concluded that the subjects did perceive a variety of emotional responses occurring in relation to their reading and that their perceptions differed according to sex, age, and major field of study. It was suggested that the checklist be further refined. Tables and references are included.

Blanchard, P. Reading disabilities in relation to maladjustment. *Mental Hygiene*, 1928, 12, 772-788.

This article presents four case studies that show a relationship between a reading disability and maladjustment. In each case the child is of average or superior intelligence. From these individual studies the author concludes that persistent reading disabilities lead to school failure and often to feelings of inferiority, which, in turn, may lead to personality and behavior deviations. She recommends that efforts to remediate learning disabilities be increased as a first step to overcoming educational maladjustment and other deviant behavior.

Brown, B. S., & Courtless, T. F. *The mentally retarded offender.* Rockville, Md.: National Institute of Mental Health, Center for Studies of Crime and Delinquency, 1973.

The monograph covers the history and current status of the institutionalized mentally retarded offender in the U.S. The authors describe historical handling and treatment of the 'feeble minded' criminals and touch on the varying definitions of 'defective delinquent.' A survey of penal and correctional institutions in the U.S. was made in 1963 (with a second phase in 1966) to gather information on the IQs, types of offenses committed by inmates with low intelligence, treatment programs, and management problems related to retarded offenders. Results showed the mean IQ to be 93.2, with a variance by geographic region for IQ falling below 70. Current state plans for retarded offenders are cited, along with critical issues and recommendations for action and research throughout the U.S.

Burns, J. Delinquents failed by the system. *Special Education*, 1971, 60 (1), 13-16.

A summary of 1,445 boys arriving at a school for the educationally and socially handicapped in Britain showed an average IQ of 95.8 and an average retardation in reading of 3.0 years. Nearly two-thirds of the boys had been failed by the regular education system in that they had been denied entry to special schools because of long waiting lists. Once a child has reached age 12, special schools are reluctant to accept him. Inadequate diagnosis, differing treatment theories and approaches, and difficulty of measuring success compound these childrens' problems. A smaller scale study of 112 boys from the same group led the author to expect that about 34 percent of incoming boys will be disruptive of the treatment regime advocated by people trying to help them. Further, it was found that the longer a boy has to wait before his educational need is discovered (or to be placed in a special school), the more likely he is to become disruptive of the treatment that should be therapeutic for him.

Cohen, H. L., Filipczak, J., Boren, J., Goding, I., Storm, R., Bishop, R. M., & Breiling, J. *Academic and social behavior change in a public school setting: PICA Final Report: Project year four.* Silver Spring, Md.: Institute for Behavioral Research, Inc., Educational Facility Press, April 1974.

"The PICA (Programming Interpersonal Curricula for Adolescents) project was conceived as a pragmatic approach to a serious educational problem--that of children who are failing to acquire during their growing years the academic and social skills required to successful functioning as adult citizens in today's highly competitive society." The program is directed to junior high students with academic problems that are usually associated with larger behavioral problems. PICA proposed to assess the effectiveness of behavior-oriented training programs, utilizing individualized instruction and behavior management. PICA began as an out-of-school, half-day, alternative training program for selected problem students, and operated out of IBR in Silver Spring. Later, PICA was applied in a neighboring junior high school and combined with its daily operations. At the beginning of year four, PICA became PREP (Preparation Through Responsive Educational Programs) and was totally relocated to the junior high school. PICA's objectives were to (1) enhance student academic learning; (2) develop student interpersonal training; (3) promote family interaction training; and (4) maximize public school personnel training. Data were gathered for PICA-PREP experimental and control groups during the four-year period. (Previous yearly reports and other PICA-PREP documents are available from IBR). This document details information gathered and analyzed from year four, with backup from previous years. The experimental group's gains exceeded the national average in the scholastic areas of arithmetic concepts, applications, and computations, and in SAT language, Gates-MacGinitie Vocabulary and Gates-MacGinitie Comprehension. The control group's gains fell below the national average in all but arithmetic applications and Gates-MacGinitie Vocabulary. Other objective data and subjective impressions by school personnel on non-academic variables were also reported.

Compton, R. The learning disabled adolescent. In B. Kratoville (Ed.), *Youth in trouble.* Proceedings of a symposium, Dallas-Fort Worth Regional Airport, May 1974. San Rafael, Calif.: Academic Therapy Publications, 1974. Pp. 44-56.

In this epidemiological study, 444 adjudicated delinquents and Children in Need of Supervision who passed through the Colorado Division of Youth Services central diagnostic receiving center from July 1972 to May 1973 were assessed to determine the incidence and type of learning disabilities among them. LD was defined as "anything which prevents a child from achieving successfully in a normal educational setting." LD youth were classified by type--visual, auditory, information processing, social and psychological--and by severity--mild, moderate, and severe. No standardized tests were used to diagnose since it was

felt that they do not distinguish between retarded and LD youth. Instead, a prescriptive diagnostic approach was used, which relied on observation to determine why the child was functioning below his level. The results showed that 90.4 percent of the youth had mild to severe learning disabilities requiring special, individualized attention. Also, a general pattern emerged from studies of these youths' public school records; 75 percent had a sudden drop in achievement coupled with truancy by the sixth grade. It was suggested that this pattern of truancy and achievement drop could be used by schools and communities for early identification of troubled youth in need of intervention. See technical summary in Appendix C.

Compton, R. Speech before the Symposium on the Relationship of Delinquency to Learning Disabilities Among Youth, Little Rock, Arkansas, December 1974.

Compton described the model program at Lathrop Park Youth Camp in Colorado as an example of how to remediate delinquent youngsters with learning disabilities. Colorado youth are classified as LD for audio-visual neurological problems, the "hard" disabilities, and for social and psychological problems, the "soft" disabilities. In 1972, 87% of the youth committed to institutions in Colorado had hard disabilities as diagnosed by a school psychologist, neurologist, physician, and ophthalmologist, and 90.4% had some type of disability. Seventy-five percent of these students exhibited a common pattern of school failure first shown by a sudden drop in achievement followed by a developing truancy pattern and eventual delinquency. These youngsters all lacked recognition from either their peer group, their family, or their school. The Lathrop Park program is designed to give the students the recognition and support they have lacked. Each youth makes a contract to accomplish certain tasks in a specified time frame. Modes of instruction are varied according to such youth's needs. Compton claims a recidivism rate of zero for all youth who remain in the camp at least 3 weeks.

Council of Europe. *Role of the school in the prevention of juvenile delinquency.* New York: Manhattan, 1972.

The text presented to the European committee on crime problems investigates the school's position in socially integrating the child and providing a stimulating environment. Studies from various countries reveal characteristics common to delinquents and characteristics of schools apt to cause delinquency. Individual and sociological factors are discussed in a theoretical framework to point up implications for research in this field. Main research methods and examples of projects are described. A model from learning psychology is applied to socialization and juvenile delinquency. Consideration is given to such individual aspects of juvenile behavior as learning, adjustment and personality development. Attention is given to prevention of delinquency including early detection of learning disorders, organic defects, and behavior problems. The conclusion focuses upon the importance of educational research and presents criteria for a sound research program. Numerous references and studies are cited.

Critchley, E. M. R. Reading retardation, dyslexia and delinquency. *British Journal of Psychiatry*, 1968, 114, 1537-1547.

Confirming earlier reports that illiteracy is associated with delinquency, 60 percent of 477 delinquent children were found to be 2 or more years retarded in reading. Left-handedness, crossed laterality, and faulty pronunciation were found frequently with the retarded readers, suggesting that many are dyslexic. A review of the scholastic and emotional background and scrutiny of some life histories failed to reveal the manner whereby a dyslexic child may drift into delinquency. See technical summary in Appendix C.

Dell, G. A. Social factors and school influence in juvenile delinquency. *British Journal of Educational Psychology*, 1963, 33, 312-322.

"An analysis of some of the educational and social factors associated with 492 police cases appearing in the Belfast juvenile court over a period of twelve months, showed the heaviest incidence of delinquency among children of secondary non-selective schools. Differences in incidence rates between Roman Catholic and Protestant children were strongly associated with differences in socioeconomic status. Other factors appearing to facilitate delinquency were low S.E.S., lesser school attainment, and, possibly, age. Independent of the general socioeconomic level, the location of a school in one of the old, central, and socially declining areas of the city was associated with a high delinquency rate. High school morale was effective in a small but measurable degree in counteracting tendencies to delinquency. Ways of increasing the strength of this influence are discussed.

Duling, F., Eddy, S., & Risko, V. *Learning disabilities and juvenile delinquency*. Unpublished paper prepared at the Robert F. Kennedy Youth Center, Morgantown, W.Va., 1970.

This study attempted to ascertain the incidence of reading disabilities (refers to those individuals reading below grade level, regardless of IQ) and learning disabilities (refers to significant deficits in the essential learning processes that are not primarily due to sensory, motor, and intellectual retardation) among the juveniles incarcerated at the RFK Youth Center. It was hypothesized that a greater proportion of the juvenile delinquents than non-delinquents would be characterized as disabled. Fifty-nine pupils (40% of the total population) were randomly selected and administered a comprehensive battery of tests (including the Berea-Gestalt, the California Auditory Discrimination, the Goodenough Draw a Man, the Huelsman Word Discrimination, the Money Dictation, the Left-to-Right Discrimination, the Gorham Proverbs, the Gilmore Oral Reading and the WRAT tests). Results indicated that 31 boys (53%) of the sample population had significant reading disabilities and that 19 boys (32%) had specific learning disabilities. The authors conclude that the youths studied have "significant reading disabilities" and a greater proportion of learning disabilities than found in a "normal" population. There is no discussion of comparability of the data from RFK and the sources who quote incidence of LD in "normal" populations. See technical summary in Appendix C.

Durfee, K. E. Crooked ears and the bad boy syndrome: Asymmetry as an indicator of minimal brain dysfunction. *Bulletin of the Menninger Clinic*, 1974, 38, 305-316.

The author cites his 1965 study of 275 children classified as mental retardates, learning disabled, delinquent, etc. Among these Ss asymmetry

of the ears ranged from 67.8% to 96.2% ($p = .005$). In the current study of 22 Ss, including some adults, significant asymmetry of the ears are likewise found ($p = .009$). It is suggested that the described technique of measuring asymmetry may be a method of screening for the possible existence of congenital central nervous system defects.

Dzik, D. Vision and the juvenile delinquent. *Journal of the American Optometric Association*, 1966, 37, 461-468.

Eighty-five to ninety percent of a student's learning is through eyesight and vision. If a child's vision is poor, his chances of success in the classroom are very low. "The act of vision and the act of reading are similar." The author suggests that there are four perceptual skills which must be acquired sequentially before a child can achieve in school. These four L's of learning to see are: Locomotion, or "where am I in space?" Location, or judging the position of things around him. Labeling, or the synthesis and integration of the first two L's to represent patterns that are then identified, and Language, or the expression of how the child visualizes. If the four L's of visual perception are established in proper pre-school sequence, the child will stand a much greater chance of success in school. The author quotes incidence of vision-related problems among delinquents and makes recommendations for proper handling of the poor readers who often become delinquent.

Elliott, D. S. *Delinquency and the school.* Draft manuscript based on a paper, "Towards a successful educational experience," prepared for the Youth Development and Delinquency Prevention Administration, Washington, 1972.

This presentation describes the situation in our public school system that fosters delinquency. The author contends that the two primary goals of school are learning and achievement. However, the two are incompatible and, in actuality, learning has taken a secondary position to the more visible certification of achievement. The basic structure of school is competitive; the successful students are rewarded by good grades while the unsuccessful ones are labeled as dumb or losers. The competitive process dictates the necessity for a group of losers, in order for there to be a group of winners. The author suggests remedying these and other inequities in the school system so that emphasis is placed on learning, not achievement. Evaluation constructs should be reviewed and restructured, and cooperative teaching and learning should be emphasized. Ability groupings should be discouraged. Compulsory attendance laws, too, should be modified. Individual students' needs should take precedence above all. These suggestions offer "delinquency prevention programs that are oriented toward making desirable social roles more readily accessible to all youth."

Elliott, D. S. Delinquency, school attendance, and dropout. *Social Problems*, 1966, 13, 307-314.

Two specific hypotheses were studied and supported: (1) "the rate of delinquency is greater for boys in school than out of school"; and (2) "delinquents who dropout have a higher delinquency rate while in than out of school." The study population consisted of 743 tenth-grade boys entering urban high schools in 1959. Dropouts totaled 182 boys while those classified as 'graduates' totaled 561 of the study group. The overall delinquency rate among graduates was 4.95 (per 10,000 in or out of school days) compared to a rate of 2.75 among dropouts. Highest delinquency rates were observed among lower SES dropouts prior to their leaving school, but this same group had the lowest delinquency rate after dropping out. Once out of school, the lower SES boys exhibited one-third their in-school rate of delinquency. For boys from higher SES areas, little differences existed between in-school and out-of-school delinquency rates.

Elliott, D. S., & Voss, H. L. *Delinquency and dropout.* Lexington, Mass.: Lexington Books, 1974.

This volume presents data from a longitudinal, cohort study initiated in 1963. The study population was 2,617 ninth-grade students in eight California schools located in metropolitan areas. The authors hypothesized that delinquent behavior was attributable to four variables:

(1) aspiration-opportunity disjunction, (2) internal-external attribution of blame, (3) alienation or normlessness, and (4) access and exposure to delinquent groups. Three types of dropouts were identified -- involuntary, educationally handicapped, and capable. Two percent of the dropouts left school involuntarily; 32% were educationally handicapped; and 66% were capable of completing high school. The proposition that delinquent behavior and dropout are alternative responses to failure and alienation, particularly in the school context, was confirmed. The authors contend that delinquency is causally involved in dropout, and dropout in turn leads to decreasing involvement in delinquency. School is the critical generating milieu for delinquency. The strongest predictors of dropout were found to be academic failure, school normlessness and social isolation, exposure to dropouts in the home, and commitment to peers. Data also showed that dropout is related to class while delinquency is not. Many figures, tables, matrices, scales, and references are included.

Feldhusen, J. F., et al. *Prediction of social adjustment over an eight year period; Correlates and long-range implications of classroom aggression; Prediction of academic achievement of children who display agressive disruptive classroom behavior.* Papers presented at the American Educational Research Association Convention, New York, February 1971.

These papers focus on early identification, by classroom teachers, children who, without planned intervention, are likely to eventually display poor social adjustment, low academic achievement and/or delinquency. The research indicates that there are valid predictors of these outcomes. Classroom teachers of selected elementary grades nominated for study aggressive/disruptive children, and socially acceptable/productive children. Random samples were drawn. For all the studies, predictors and criteria are made explicit. Significant predictors were found for later social adjustment: (1) classroom behavior traits, (2) arithmetic achievement, (3) response to a sentence completion test, (4) a child's parents' marital relationship, and (5) maternal discipline. Significant factors were also found for academic achievement: (1) teacher ratings of social adjustment, (2) IQ, (3) sex, (4) scores on a behavioral problems checklist, (5) parents' education level, and (6) classroom behavior. Both poor social adjustment and low academic achievement are correlated with aggressive/disruptive behavior and all three are correlated significantly with eventual delinquent behavior in the community. Early identification and individualized intervention are urged. Remediation and behavior modification are highly recommended.

Fendrick, P., & Bond, G. Delinquency and reading. *Journal of Genetic Psychology*, 1936, 48, 236-243.

The study is based on the conjecture that failure to learn to read adequately is related to delinquency. The population of delinquents studied (187 boys, ages 16-19, at the House of Refuge in New York City) showed markedly inferior achievement in reading. There was found to be a mean disparity of 5 years, 8 months between the chronological and reading ages of the total group studied. Among the boys with IQ range from 90 to 110, a mean difference of 5 years existed between chronological age and reading status. These findings demonstrate that this delinquent population was quite retarded in reading skills. The author feels that future studies should determine the impact of reading maladjustment upon delinquency.

Fishman, J. A new look at special problems, Project Beacon--a project addressed to the needs of the socially disadvantaged. Reprint from *Pioneer ideals in education*, September 1963.

A great number of American children are growing up in socially deprived surroundings. These deprivations are reflected in lower educational achievement. Teachers should have special preparation in order to lessen this waste of educational potential. Project Beacon is an effort to

introduce within the public school system a permanent corps of psychoeducational specialists who have been rigorously trained to meet the educational needs of socially disadvantaged children and their parents. It is a long-range program to attack the problems of delinquency and school dropouts through (1) behavioral science research into the relationship between learning and social disadvantage and (2) graduate level training of psychoeducational personnel such as psychologists, guidance specialists, administrators, and teachers who work with socially disadvantaged children and their parents. Disadvantages include improper learning habits, obscured vocational and personal goals, inadequate preparation and motivation, and conditions of life which discourage the practices and values necessary for adjustment and achievement in our society. The project seeks to improve the educational achievement levels of these children, and to enhance the preparation and add new dimensions to career opportunities for personnel who want to work with disadvantaged children through public schools. Training for project Beacon student teachers centers around three categories: (1) home, community, and school analysis, (2) child appraisal, and (3) psychoeducational processes and guided development. A description of each category includes the courses offered and parallel field work in the community, in schools, and in the psychological center.

Gates, A. I., & Bond, G. L. Failure in reading and social maladjustment. *Journal of the National Educational Association*, 1936, 25(7), 205-206.

The author reports that "it has long been known that failure or serious retardation in learning to read almost always results in failure or backwardness in school work...." If serious difficulty in reading disrupts a pupil's school career, it may be expected that it will disturb his personal and social adjustment. In 1933, a New York city-wide project was undertaken to detect, roughly diagnose, and apply remedial instructions to the most serious cases of reading difficulty. A top-ranking school official backing the operation was convinced that continued frustration in school, produced by inability to read efficiently, frequently leads to truancy and delinquency. Of the selected students provided remedial instruction, 95% made gains at least as great as the average pupil makes in the same time. Evidence also showed that better emotional and social adjustment and conduct usually accompanied, or followed, the scholastic improvement. In a sub-sampling of typical reading disabled cases, the group that was 'coached' individually by remedial reading teachers showed gains in reading ability more than three times greater than the matched, uncoached control group.

Glueck, S., & Glueck, E. *Predicting delinquency and crime*. Cambridge, Mass.: Harvard University Press, 1960.

In this classic work, the Glueck team attempted to operationalize the means for predicting delinquent behavior with the goal of more equitable administration of criminal justice. Basically, the predictors are based upon correlations between delinquency and delinquent character and social traits, and comparisons of delinquents and non-delinquents. Additionally, a causal etiology is presented based on (1) intelligence, (2) physical condition, (3) character structure, (4) mental condition, (5) temperament, (6) family and home background, (7) school behavior, and (8) general background.

Gormly, J., & Nittoli, M. J. Rapid improvement of reading skills in juvenile delinquents. *Journal of Experimental Education*, 1971, 40(2), 45-48.

Researchers pretested 20 male adolescents committed to a state institution as delinquents on the WISC and the Gates-MacGinitie Reading Tests for grades 4-6. Ss then participated in a short-term reading program which provided structured self-instruction, high interest reading material, and reduced chances of experiencing failure. After completing an average of 24 50-minute sessions, significant improvement was found in vocabulary, speed, and accuracy in reading ($p < .01$) which exceeded a gain of a year on grade-normed Gates-MacGinitie posttests. Ss responded favorably to the program, and discipline problems were minimal. Reading improvement was not related to IQ. It is concluded that remedial education is an important aspect of correctional programs for delinquent youths.

Graubard, P. Psycholinguistic correlates of reading disability in disturbed children. *Journal of Special Education*, 1967, 1(4), 363-368.

Subjects of this study were 35 children, 8-11 years old who had been placed by the court in residential treatment centers because of anti-social behavior. Extensive testing confirmed the hypothesis that a disturbed, delinquent population would deviate from normal communication processes. The author points out that this population has special attributes and deficits, and needs teaching designed to remediate their weaknesses. Most deficits found were at the integrational level and in the visual motor channel. Suggested methods of instruction included the phonics approach to reading, development of an art and crafts program to aid in eye/hand coordination, training to use symbols for concepts, learning directional relationships (right-left, up-down), and utilization of color in letters and words to accentuate differences. "The data suggest that research must be done in devising training methods to remediate integrational deficits particularly at the visual-motor channel."

Graubard, P. S. Utilizing the group in teaching disturbed delinquents to learn. *Exceptional Children*, 1969, 36(4), 267-272.

A group of disturbed, delinquent children were taught under three conditions: ( ) with group consensus determining reinforcers, followed by, (2) a noncontingent reward condition, and finally by (3) group and individual contingencies condition. "The group acted as its own control." Dependent variables were reading gains and appropriate classroom behaviors. Making rewards for all subjects contingent on each subject's behaving appropriately proved superior to giving rewards on a noncontingent basis. Giving group reinforcers for appropriate classroom behavior, plus individual reinforcers for academic achievement, proved to be the most efficacious. The group can be a powerful instrument in teaching disturbed delinquents."

Gromfin, A. M., et al. *Curriculum development: Strategies for change; and delinquency: Causation, learning, and curriculum.* Los Angeles: University of Southern California, School of Education, November 1971.

This module is the first in a curriculum development component. It is designed to enable prospective teachers to develop curricula for delinquency prone youth. The prospective teacher is presented with an overview of learning theory after an exploration of delinquency causation providing him/her with greater insight as a basis for curriculum planning. The module itself includes steps for completing the module, a preassessment, a description of enabling elements, a post-assessment, and a remediation. There is also a bibliography.

Haskins, J. R., & Friel, C. M. *The mentally retarded in a juvenile correctional institute--Project CAMIO*, Vol. 5. Huntsville, Texas: Sam Houston State University, Texas Institute of Contemporary Corrections and the Behavioral Sciences, and Texas State Department of Mental Health and Mental Retardation, December 1973.

Evaluated were 1,666 juvenile inmates committed to the Texas Youth Council. The study was part of Project CAMIO, a Texas effort to determine the incidence of criminal incarceration of the mentally retarded (MR) and to identify laws, procedures, and practices which affect the prosecution and imprisonment of the MR offender. Information was gathered on intelligence, age, race, sex, drug and alcohol history, prior delinquency, and current commitment information. Findings indicated that approximately 12.9% of the males and 16.6% of the females were retarded (compared to 3% incidence in the general population). More MR than non-MR inmates were from minority groups, had poorer school attendance records, came from financially impoverished families, and came from large families. MR offenders were less likely to have a history of drug and alcohol use than non-MR offenders. MR offenders were granted probation significantly less frequently than non-MR offenders. Current commitment offense was less likely to have involved codefendants with MR offenders than with non-MR offenders. Additionally, the investigation revealed that one out of seven retarded youths were improperly committed, since there is a Texas law prohibiting incarceration of MR juveniles within Youth Council facilities.

Henderson, P. Changing pattern of disease and disability in school children in England and Wales. *British Medical Journal*, 1968, 2, 329-334.

This article describes the disease patterns of cerebral palsy, spina bifida, muscular dystrophy, hemophilia, diabetes, epilepsy, blindness, deafness, speech and language disorders, retardation, emotional disturbance, autism, brain-damage, and delinquency among school-aged children in Britain. Among those that were delinquent, it was found that a minority are persistent offenders and that the success of special schools in dealing with delinquents had lessened in recent years. The necessity for interaction between the medical, social, education, and health fields is pointed out.

Hogenson, D. L. Reading failure and juvenile delinquency. *Bulletin of the Orton Society*, 1974, 24, 164-169.

Data on two experimental populations of 48 boys each from state training schools in Lansing, Michigan and Red Wing, Minnesota were evaluated to assess a hypothesized relationship between reading failure and antisocial, aggressive behaviors. Data included a complete social and behavioral history, including court transcripts; an individual Wechsler intelligence test; a reading achievement score based upon Form K of the

Stanford Achievement Test; a student attitude instrument; a measure of Rokeach's construct dogmatism; and data concerning family, community, economic, and ethnic variables. Only reading failure was found to correlate with aggression in both populations of delinquent boys. IQ was equally related to reading among more and less aggressive boys.

Holte, A. Confessions of a juvenile court judge. Speech before the 9th Annual International Conference on Children with Learning Disabilities, February 1972.

In this speech, a juvenile court judge describes how he came to recognize the relationship between learning disabilities and delinquency, citing several informal studies which showed that delinquents with normal IQ's frequently read below grade level. He concludes that learning disabled children will become severe social problems at great costs to society unless preventative measures are taken in the early school years.

Hurwitz, I., Bibace, R. M., Wolff, P. H., & Rowbotham, B. M. Neuropsychological function of normal boys, delinquent boys, and boys with learning problems. *Perceptual and Motor Skills*, 1972, 35(2), 387-394.

Two studies comparing the sensorimotor function and cognitive styles of normal boys, juvenile delinquents, and boys with learning disabilities (14-16 years old) are reported. The two clinical groups performed significantly poorer on the Lincoln-Oseretsky Test of motor development than normal boys and had particular difficulties on items of the test requiring rhythmical repetition. In a second study, the sequencing skills of normal boys and matched delinquents were compared. Delinquent boys did consistently more poorly on tasks of sensorimotor and symbolic sequencing than normals; tests of spatial ability did not discriminate the groups. Results are discussed in terms of implications for the functional analysis of behavior disturbances.

Jackson, N. Educable mental handicap and delinquency. *Educational Research*, 1970, 12(2), 128-134.

In a sample population of 232 mentally handicapped ex-pupils drawn from special schools and classes in a Scottish city and county, 29.8% of the boys and none of the girls had delinquent records. There was a marginal, though not significant, tendency for the delinquent youths to be more intelligent than the nondelinquent youths. A significant relationship was found between delinquency and (a) an absence of physical defect, (b) family neglect, (c) abnormal family structure, and (d) occupational instability. Those youths committing their first offense after leaving school were found to be significantly more intelligent than those whose first offense was committed while of school age. A relationship was found between postschool first offense, occupational instability, and high measured intelligence.

Jacobson, F. Learning disabilities and juvenile delinquency: A demonstrated relationship. In R. E. Weber (Ed.), *Handbook of learning disabilities: A prognosis for the child, the adolescent, the adult.* Englewood Cliffs, N.J.: Prentice-Hall, 1974. Pp. 189-216.

This concept paper details the historical evidence for a relationship between learning disabilities and delinquency, presents a theoretical linkage between the two behaviors and discusses implications of this finding for research, delinquency prevention, and teacher selection and education. The author proposes that the importance of evidence that learning disabilities occur frequently in delinquents was eclipsed for years by greater attention to social intrapsychic and intellectual factors. His explanation of demonstrated correlations is that schools are success ladders and children with learning disabilities are handicapped in such an extensive, competitive system. Since they rarely succeed, they become frustrated by school and exhibit delinquent behaviors. The teacher becomes frustrated in turn by the child's seeming lack of motivation and applies labels which only further catalyze a delinquent orientation.

The relationship as presented implies that research and prevention efforts be aimed at early diagnosis and treatment of learning disabilities. To accomplish this, the author suggests educating involved personnel as to symptoms and means of dealing with LD children. The ultimate step is to modify the failure-producing structure of the school that adversely affects both LD and other students.

Jacobson, F. N. *The juvenile court judge and learning disabilities.* Paper presented at the National Council of Juvenile Court Judges Graduate College. University of Nevada, Reno, August 12 and November 11, 1974.

"Learning disability is a basic factor in delinquency. Learning disabilities, after they lead to delinquency, eventuate in a compound problem and need specific treatment to achieve rehabilitation." The author contends that approximately 12% of the population is learning disabled; and that at least 50%--perhaps even 80%--of delinquents are also learning disabled. What learning disabilities are and what they are not, are discussed in detail in this presentation, as well as factors that may cause LD, and means for evaluating or assessing a learning disabled child. The author also discusses JD, and its relationship to LD in terms of school and society, the frustration that leads to deviance, and resultant effects of labeling. A child that is simply LD may be negatively labeled by teachers and may then embark on a delinquent career. Many teachers consider LDs to be underachievers who can perform, but choose not to. Jacobson states that LD is not a "won't do" handicap--it is, in fact, a "can't do" problem. The author's position is that "most frequently delinquency begins in an antagonistic interaction between teacher and student, and that the basic cause of that antagonism is learning disabilities." Appended list also include observable warnings or signs of LD categorized by motor coordination, behavior, auditory or vocal responses, communication, vision, and academics.

Jordan, D. *Learning disabilities and predelinquent behavior of juveniles.* Report on a project sponsored by the Okalahoma Association for Children with Learning Disabilities, May 1974.

Eighty-one percent of 100+ juveniles administered the Jordan Written Screening Test for Learning Disabilities at the Youth Bureau intake interviews were classified as probably learning disabled. The eighty LD youth were equally divided into a study and a control group in order to test the effects of remediation on school performance and on unacceptable social behavior. Tests administered to the study group included the WISC, WAIS, Bender Drawing Test, the Rorschach, the House-Tree-Persons test, the Jordan Oral Screening test, the Keystone Visual Survey test, the Spache Binocular Reading Test, neurological evaluations, and EEGs. The study group received tutoring in coding/encoding skills and personal attention from the volunteer counselor/tutors. The control group received the Youth's standard counseling services. Results showed that the experimental group showed steady increases in school achievement levels and decreases in unacceptable social behavior over the two semester periods, whereas the control group showed few achievement gains. (Control group social patterns were not mentioned). Complete profiles of the study group are presented in the report.

Jorgensen, E., Bangsgard, O., & Glad, T. Adolescent psychiatry in a private Danish institution. *Journal of Learning Disabilities*, 1968, 1(1), 33-44.

This article relates a practical approach to dealing with adolescent boys and men. While the majority of the school's population consists of juvenile delinquents, it is suggested that a large portion of the pupils may have started out as children suffering from some form of learning disorder. This study questions whether a great part of the pupils are retarded, and asks if, in some cases, this is true mental retardation or a reflection of the handicap of a learning disability. The school is based on a "help to self-help" principle which supports the young men and their families in their efforts to build a satisfactory existence. This private social-pedagogic institution also helps to overcome personal handicaps and other difficulties of its clientele by finding and cultivating individual positive characteristics.

Karnes, M., et al. *The efficacy of a prevocational curriculum and services designed to rehabilitate slow learners who are school dropout, delinquency, and unemployment prone.* Champaign, Illinois Community Unit 4 School District, August 1966.

It was hypothesized that 91 experimental subjects from low socioeconomic status homes, provided with a carefully designed 2-year vocationally oriented educational program and prevocational Division of Vocational Rehabilitation (DVR) counseling, would have significantly superior achievement to that of a matched control group enrolled in a regular educational program without such benefits. Data were collected from school records, interviews, case studies, various psychological tests, and DVR records. The experimental subjects had significantly better attendance and fewer school dropouts, and made a better vocational adjustment than the control group. There was no significant difference between the two groups in social and emotional adjustment as measured by social maturity, perception of peer acceptance, perceived anxiety, and ability to determine the appropriateness of certain activities or goals. Achievement test scores for the tool subjects of arithmetic, reading, and spelling showed no significant differences between the two groups in amount gained. Some implications for program implementation were that specially trained administrative and teaching personnel should be employed for this kind of program. The ratio of teacher to youth should be no greater than 1:20, and the curriculum should be functional, individualized, and vocationally oriented. A review of related literature, a complete program description, and recommendations for further research and programming are included.

Keldgord, R. F. Brain damage and delinquency: A question and a challenge. *Academic Therapy*, 1968, 4(2), 93-99.

This article reviews the available literature relating to brain damage and delinquency, emphasizing at the outset how little had been done. The author reviews titles in the professional criminological literature, then discusses ongoing efforts in Alameda, Merced, and Sonoma Counties in California. Statistics on juvenile offenders and brain-damaged children are compared, leading to the author's conclusion that up to 1,094 of the 5,470 youth committed to the California Youth Authority in 1966 may have been brain damaged. The article concludes with recommendations for immediate, multi-disciplinary work on the problem.

Kelly, D., & Pink, W. School commitment, youth rebellion, and delinquency. *Criminology*, 1973, 10, 473-485.

The hypothesis that decreasing levels of commitment to school are associated with increasing rates of youth rebellion and delinquency was tested on 292 male high school sophomores. Interviews obtained information on grades, time spent on homework, affiliation with school clubs and activities, and whether subjects planned to attend college. Questionnaires elicited data on allegiance to school and peer group loyalty, aggressive behavior, drinking, and whether the subjects had ever been apprehended for delinquent or felonious behavior. Results supported the hypothesis; subjects displaying lower degrees of commitment to school had much greater rates of rebellion and delinquency. It is suggested that social labeling of a student as unmotivated, behavior problem, or poor worker can lead to declining levels of school commitment and differential treatment by teachers and peers.

Kerr, J. Crime and dyslexia. *Criminologist*, 1973, 8(29), 29-32.

Drawing on British research, the author relates deviant behavior to a reading disability and resultant low academic achievement, frustration, and rebellion. The need for teacher recognition of social and emotional difficulties of pupils is stressed. The provision of specialists to improve language skills is suggested.

Kvaraceus, W. C. Reading: Failure and delinquency. *NEA Journal: Today's Education*, 1971, 60(7), 53-54.

This is a commentary on children who fail to read and their subsequent behavior in a hostile school environment. Failure and frustration in school can result in norm-violating aggressive actions that attempt to mend an individual's loss of self esteem and ego-deflation. Teachers often become the hate object for hostile, failing delinquents. Delinquents sometimes identify with an older delinquent or ally themselves with delinquent groups for defense and support. Youngsters also displace their aggressive activities into the home and community. Other delinquents project their hostility onto a list of their "enemies"--teachers, police, parents, and achievers in school. The delinquent may consider himself a victim of a grand conspiracy to keep him captive in a school establishment, and may react like a martyr or even a savior. The author cites the need for understanding and supporting school personnel and significant others in attempts to help the failing student and prevent his potential problems.

Kvaraceus, W. Forecasting delinquency: A three-year experiment. *Exceptional Children*, 1961, 27, 429-435.

This study aimed to gather validation data on the revised Kvaraceus Delinquency Proneness Scale--Non-Verbal. In a before-and-after study design, prediction scores were obtained on the basis of independent teacher judgement of future delinquency. Subjects were 7th, 8th, and 9th graders in one community and pupils of the same age enrolled in special classes for the mentally retarded in two communities. They were followed for three years. Juvenile delinquency was defined as "norm-violating behavior." Conclusions of the study were that, (1) the revised KD Proneness Scale failed to meet the test set up in the research design; (2) ratings of teachers showed more promise for identifying future norm violators than the scales, (3) junior high school students who fall into low reading groups tended to show a heavy preponderance of norm violations, (4) a trend was apparent for low IQ youth to get lower behavior ratings and show more evidence of norm violations; (5) in special classes for the mentally retarded, the "brighter" youngsters evidenced more behavioral difficulties than their duller classmates; and (6) there is potential utility and reliability in a non-verbal scale for delinquency identification and subsequent prevention programs.

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Love, W. C., & Bachara, G. H. A diagnostic team approach for juvenile delinquents with learning disabilities. *Juvenile Justice*, 1975, 26(1), 27-30.

Recognizing the relationship between juvenile delinquency and learning disabilities, the Norfolk Juvenile and Domestic Relations District Court established a diagnostic and evaluation team to assist the juvenile court in its probation program. A diagnostic team studied the juvenile's social, educational, and psychological background to determine the proper treatment modality. For most children, a behavioral modification group therapy program proved helpful. Other areas in the program involved athletic competition. The authors assert that "probably the most significant need for the learning-disabled juvenile delinquent is an individualized reading program." The study promotes the need for collaborative, multidisciplinary approaches in treatment programs.

Margolin, J., Roman, M., & Harari, C. Reading disability in the delinquent child: A microcosm of psychosocial pathology. *American Journal of Orthopsychiatry*, 1955, 25, 25-35.

In 1951, a survey of the Court Intake Project at NIMH showed 84% of the children to be retarded in reading by two or more years. This experimental study was designed to determine the most effective means of remediating these retarded students. The 21 subjects were divided into three groups: (I) remedial reading, (II) tutorial group therapy, and (III) interview group therapy. Results of these treatment approaches were that: Group I improved in their reading by 39%; Group II, by 74%; and Group III, by 26%. The tutorial group therapy (II) was found to be a successful, new treatment approach, which involved remedial assistance while encouraging discussion of past experiences. Part of the goal was to identify what had interfered with their learning to read, and to express their feelings about teachers, school, reading, and other matters. Improvement in school and adjustment was also greatest in Group II (71%), compared to Group I (45%), and Group III (28%). Adjustment at home was improved among 81% of the tutorial group, with the other groups each experiencing a 71% rate of home improvement. The authors conclude that children with learning disabilities must be identified and aided before truancy and subsequent delinquency develop; that schools must recognize that lower class children cannot be expected to learn in the same manner as middle-class children nor with the same curriculum; and that preventing the development of learning difficulties is one of the steps in preventing the growth of delinquency.

Matthews, C. *A project to prevent school dropouts in the Quincy, Illinois Public Schools.* Unpublished paper, Delinquency Study Project, Southern Illinois University, undated.

This paper describes a project aimed at identifying and counseling dropout-prone students before critical school failures. It was developed for use in an average public school system. The study team used SES, intelligence, school achievement, reading achievement, size of family and birth order, and school and social adjustment indicators to determine dropout proneness. The general activities of the project included: school counselor visits to dropout-prone students' homes; intensive individual counseling; school progress checks; group counseling sessions; and regular meetings between the project director and the teachers and counselors involved in the project. Results of the program have contributed to a reduction in the dropout rate. The reduction is attributed to earlier discovery and treatment of problems, and to greater awareness among the faculty of problems specific to potential dropouts and techniques useful in helping them. Curricular modifications for dropout-prone students are recommended.

Matthews, C. *School factors influencing the school persistence of low socioeconomic status, low ability students.* Unpublished paper, Delinquency Study Project, Southern Illinois University, undated.

This paper deals with the functional disparity that currently exists between the school and a large portion of its students. Recommendations are based on data from the Quincy, Illinois public schools. The majority of the kids who drop out of school are from low SES background, and have low ability levels. They have often failed in pre-school years, and experienced extensive failure in the success-oriented, competitive, geared-to-academic achievement, school system. The largest number of failures among students in high school who later dropped out was in industrial arts courses. Only rarely do schools have activities in which students from low SES backgrounds can play an important part. The author contends that if schools are to be seen as a realistic means to vocational success, they must move closer to realizing the ability levels of the lower twenty percent of their students. The schools must strive for goals which are reachable by the culturally deprived student, making success a certainty for each student. Suggested are pre-school education parental involvement, enrichment programs, individualization, work-study programs, and extensive modification of public school curricula.

Matthews, C., & Roam, J. *A curriculum demonstration program for dropout-prone students: Delinquency study and youth development project.* Edwardsville, Illinois: Southern Illinois University, Center for the Study of Crime, Delinquency, and Corrections, June 1966.

A demonstration program was conducted with slow-learning, socially alienated students from the Quincy, Illinois public school system. Full-time classes were established for grades 7 to 12, containing special learning units in language arts, social studies, arithmetic, science, industrial arts, home economics, physical education, and work experience. The experimental (demonstration) group was selected from students judged to be most dropout-prone on the basis of (1) intelligence, (2) reading achievement, (3) general achievement, (4) socioeconomic status, and (5) school adjustment. A matched control group was formed which received neither curricular adjustments, work experience, nor services of nonteaching personnel who worked with the demonstration program. A statistical analysis of data obtained during a 3-year study indicated that: (1) the program was significantly successful in improving the holding power of school, (2) special reading and arithmetic programs produced significant gains in achievement, and (3) students in the work experience program did not significantly improve in their academic performance when compared with students in the control group. Additional study and revision of the curriculum were recommended.

Mauser, A. Learning disabilities and delinquent youth. *Academic Theraphy*, 1974, 9(6), 389-402.

The author points out differences between today's delinquent and his counterpart of 10-15 years ago. The delinquent today is younger, brighter, and can be culturally typified. In linking the delinquent to his school situation, the author contends that truancy is very frequently related to delinquency. Similarities between LD and JD were cited: (1) both groups evidence negative self-concept and low frustration tolerance; (2) both are primarily associated with the male species; (3) directional orientation problems are common among both groups; (4) minimal brain dysfunction occurs more frequently among delinquent and learning-disabled youth; (5) children from both groups have difficulties in school, beginning in the primary grades; (6) both phenomena have multiple causes and complex treatment approaches; and (7) both groups lack positive personality characteristics. Despite these similarities, "not all delinquents are learning disabled and not all learning disabled are juvenile delinquents." Further reviewing the current state of knowledge on LD/JD, the author cites various treatment programs, associates school and teacher's roles with delinquency and LD problems, and asserts guidelines for treatment of delinquency.

Mauser, A. Learning disabilities and delinquent youth. In B. Kratoville (Ed.), *Youth in trouble*. Proceedings of a symposium, Dallas-Fort Worth Regional Airport, May 1974. San Rafael, Calif.: Academic Therapy Publications, 1974. Pp. 91-102.

The author discusses similarities between leading concepts of learning disabilities and juvenile delinquency, and focuses on the following behavioral similarities between the two populations: (1) both groups dislike subjects requiring strict logical reasoning, persistency of effort and good memory; (2) both evidence a negative self-concept and low frustration tolerance; (3) both problems are primarily associated with males; (4) both groups have directional orientation problems; (5) there is a greater incidence of minimal brain dysfunction among both groups; (6) both groups have difficulties in school in the primary grades; (7) both groups have normal IQ scores, and (8) both delinquency and LD appear to have no single cause nor cure, but are associated with a variety of etiological factors and treatment strategies. It is emphasized that prevention and treatment for both LD and JD are often inseparable. Both require early identification of specific problems by concerned teachers and other significant persons, and intensive community-based treatment focusing on each youth's needs. Specifically, the author recommends flexible school programs for youth who are not learning, such as the bookless approach to education developed by the Silberbergs, and vocational education. It is concluded that collaborative treatment programs including input from many disciplines--education, law, medicine, psychology, sociology, and social work--are the only answer to increasing crime rates.

Mauser, A. J. *The remediation of learning disabilities in juvenile delinquent youth*. Unpublished paper, Northern Illinois University, undated.

This presentation describes treatment approaches to youth who are both delinquent and learning disabled. The author cites several studies describing delinquents and learning disabled youth, and repeats various recommendations for handling these problems. Collaborative efforts from the fields of education, law, medicine, psychology, sociology, and social work are necessary in the rehabilitative process. Not all juvenile delinquents are learning disabled; neither are all learning disabled children delinquents. But when the two occur in one child, that child needs specialized, individualized treatment.

Mercer, J. R. *Socio-cultural correlates of learning and behavior "problems."* Paper presented at Conference on Learning Disabilities and Behavior Problems, Washington, D.C., June 1974.

In this presentation, the author criticizes the use of a pathological or medical model as a framework for investigating human behavior. Whereas a medical model is good and useful for describing biological functions and malfunctions, it is neither proper nor acceptable for use in describing human behavior, i.e., "learning and behavior problems." Neither is the traditional statistical framework a proper conceptual model for determining normality and abnormality. The author promotes the use of a social system model which encompasses a patterned set of statuses and their associated roles, and a normative structure. Such phenomena as "disabilities" and "problem" behaviors are defined within the normative structure. Abnormality is relative to its social context. Within a social system model, each separate sociocultural group is a distinct social system, with its own normative structure. Roles and behaviors are defined and allowed to operate differently within each social system. The author has applied her social system model to research on the exceptionality of California public school children. Mothers of 700 Black, 700 Chicano/Latino, and 700 Anglo-American children were interviewed and scored on factors of: family structure, Anglization, occupation, family size, parent/child relationship, sense of efficacy, source of income, urbanization, and community participation. Results are reported; suggestions for further research are made.

Miller, W. H., & Windhauser, E. Reading disability: Tendency toward delinquency? *Clearinghouse*, 1971, 46(3), 183-187.

"This article explores the relation between reading disability and the tendency toward delinquency in secondary school students.... The article takes the position that some of the incidence of delinquency could be prevented through the prevention of reading disability." Disabled readers and delinquent students possess similar personality characteristics such as emotional maladjustment, hostility, and suspicion. Both groups usually have a negative self-concept and a low tolerance to frustration. The school's role is important in preventing delinquency

among a delinquent-prone group. By preventing reading failure in elementary grades, or by providing special reading help in later years, the potential reading retardation--truancy--delinquency triad can hopefully be eliminated.

Minuchin, S., Chamberlain, P., & Graubard, P. A project to teach learning skills to disturbed, delinquent children. *American Journal of Orthopsychiatry*, 1967, 37, 558-568.

In this study, patterns of communication in low socioeconomic families which produce acting-out children were analyzed. Six disturbed, delinquent children were followed for five weeks in a community residential treatment center. An experimental "game" curriculum was developed that involved collaboration between clinicians and educators. Strategies were developed for intervention or "repairing" curriculum which made it feasible to teach the disturbed children. Lessons focused on: listening, the implications of noise, staying on a topic, taking turns and sharing in communication, telling a simple story, building up a longer story, asking relative and cogent questions, categorizing and classifying information, and role playing.

The curriculum appeared to be quite effective in changing learning behavior. The authors conclude that "with these children, as in the general field of learning disabilities, the underlying correlates of the disability must be remediated before successful teaching of the skill per se can be accomplished." Children must be able to master a curriculum which develops their ability to focus attention and use standard rules of communication. These abilities must be acquired before any meaningful academic skills can be mastered.

Mulligan, W. This side of the court. In B. Katroville (Ed.), *Youth in trouble*. Proceedings of a symposium, Dallas-Fort Worth Regional Airport, May 1974. San Rafael, Calif.: Academic Therapy Publications, 1974. Pp. 32-38.

The author believes that a disproportionate number of the 8 million learning disabled youth in the U.S. are processed through the juvenile justice system. He describes how the Sonoma County Probation Department first became aware of the problem, and the screening program they designed to test for learning disabilities. Their screening process begins in the area of motor coordination and includes the Peabody Picture Vocabulary Test for IQ, the WRAT, the Gray Oral Reading, the Wepman, and selected portions of other tests. The profile of each child is sent to a referral source (neurologist, pediatrician or school) where the emphasis is on diverting the LD youth from the juvenile justice system by placing him in appropriate community treatment programs. In conclusion, a proposed research project is described which "will doubtless dramatically point up the need for early identification and treatment of children with learning disabilities as well as the necessity for remedial programs for those already in the system." If such programs are established, the author believes we can substantially reduce delinquency.

Mulligan, W. Dyslexia, specific learning disability, and delinquency. *Juvenile Justice*, 1972, 23(3), 20-25.

The relationship between dyslexia and specific learning disabilities, on the one hand, and delinquency, on the other, is discussed. The probation worker who is well informed with regard to the problems of the dyslexic child will usually be more understanding of the fears, frustrations, and inability of this child to compete in the regular classroom setting or even within his own peer group. Some of the symptoms of specific language disability have been found to include poor ability to discriminate visual likenesses or differences in words even though vision is normal, directional confusion, poor ability for visual or auditory recall of words, early tendency towards motor clumsiness, and behavioral problems. Probation officers are encouraged to have delinquent children referred for screening tests in order to determine whether any learning disabilities exist before an overall disposition is made.

Mulligan, W. A study of dyslexia and delinquency. *Academic Therapy Quarterly*, 1969, 4(3), 177-187.

In the author's capacity as Chief Probation Officer for Sonoma County, California, he reports his interest in and investigation of the occurrence of dyslexia and other reading disabilities among delinquents. Surveying the total caseload of juveniles in one year, most of them were found to be reading below grade level. Based on that information, the possibility was asserted that dyslexia might be a contributing factor to their delinquency. Symptoms of dyslexic children are listed, as well as information items needed in personal histories for adequate diagnosis and treatment. Through preliminary screenings, a significantly large number of children who may have learning disabilities have been found. The need for a probation worker to be knowledgeable about and sympathetic to the problems of the dyslexic child is set forth. The author asserts his opinion that "if we are going to effectively rehabilitate juveniles, we must be aware of their total problem."

Myklebust, H. R. (Ed.) *Progress in learning disabilities*. Vol. 3. New York: Grune & Stratton, 1975.

This third volume in the series on learning disabilities emphasizes interdisciplinary approaches to intervention. (Vol. 1 dealt with concepts, definitions, differential diagnosis, and identification; Vol. 2 added concepts for management and treatment of LD). One new development in the LD field has been the cognitive systems approach to assessment and remediation which appears as a major theme in the book. Medical/physiological problems are addressed--particularly medical diagnosis and treatment, and the role of seizures. Association between learning disability and social maladjustment is pointed out. School programs that provide remedial services are outlined, and the difficulty of handling this complex of problems within one individual is stressed. Emphasis is given to procedural handling of children, so that they are helped in the most complete and positive way. Educators, psychologists, clinicians, psychiatrists, social workers, and

parents should expect to collaborate in these multidisciplinary efforts to help learning disabled children.

Peterson, M. Juvenile delinquency as a form of learning disability. *Connecticut Teacher*, 1971, 39(2), 11-14; 31.

In this review of documentation on learning disabilities and juvenile delinquency, the author recommends sophisticated research to find causes, diagnoses, and treatment of LD and JD problems. Malnutrition and chemical malfunctioning have been suggested as contributors to problems of adjustment and learning. Inadequate pedagogy is cited as another causative factor of JD and LD. New approaches from courts and law enforcement agencies are encouraged. Some chemical malfunctions that have been largely ignored are believed to contribute to learning difficulties. The author recommends that diagnostic evaluations of individuals include a thorough examination of the endocrine system, along with the more traditional battery of psychological tests, pediatric exam, eye exam, and EEG. Such glandular system testing could find a relationship between metabolic malfunctions and learning problems.

Petrie, A., McCulloch, R., & Kazdin, P. The perceptual characteristics of juvenile delinquents. *Journal of Nervous and Mental Disease*, 1959, 134, 415-421.

The two hypotheses of this study were (1) that in certain delinquents there may be some unrecognized organic pathology; and (2) that in others there may be certain unrecognized perceptual needs and consequent vulnerabilities resulting from their particular perceptual characteristics. Ss in this experiment were 70 delinquents, aged 13-17, with a control group of the same age in public schools. Experiments were conducted to determine if Ss tended to decrease perceived size of an object (through holding and feeling while blindfolded), to increase the perceived size, or to alter perceived size very little. The delinquent group contained significantly more reducers (those who tend to decrease perceived size). "Delinquents are thus prone to the vulnerabilities associated with reducing characteristics..to suffering from monotony, isolation and enforced inactivity." The authors suggest that delinquents and pre-delinquents need "change, movement and speed, actual rather than "symbolic" instruction, bright colors, music and company."

Polk, K., & Schafer, W. E. *Schools and delinquency*. Englewood Cliffs, N.J.: Prentice-Hall, 1972.

This collection of articles by the authors focuses on how the school system contributes to delinquency. It is divided into 3 major sections: perspectives on the school experience and delinquency; some supporting studies; and ways that the school contributes to delinquency. The general theme is that the schools foster maladjustment and failure among certain groups of youth, and that the stigma of failure generates rebellious behavior often ending in delinquency.

Poremba, C. D. Learning disabilities, youth and delinquency: Programs for intervention. In H.R. Myklebust (Ed.), *Progress in learning disabilities*. Vol. 3. New York: Grune & Stratton, 1975. Pp. 123-149.

"The case for the relationship between learning disabilities and delinquency clearly is being made. The pattern of the delinquent is quite evident: early school failure, frustration, acting-out, truancy, apprehension, more frustration, development of poor self-image, alienation, and finally being pushed out, or dropping out as a response to the overwhelming sense of defeat." The author asserts that the major line of defense against rising crime and delinquency rates is early school diagnosis and intervention. Early identification, various school programs, and community agencies are discussed as important operatives for intervention. The responsibility of the legislature to service troubled youth is required. The Lathrop Park Youth Center program is described as an example of a successful alternative education process. Poremba concludes that the judicial and corrections systems need to better understand learning disabilities since LD seems to be a major contributing cause of delinquency. Intervention must take place through legislation, financial support of remedial education, vocational training, job opportunities, and community business and industrial enterprises.

Poremba, C. Speech before the Symposium on the Relationship of Delinquency to Learning Disabilities Among Youth, Little Rock, Arkansas, December 1974.

In this opening speech of the Little Rock conference, Poremba gives a broad overview of inadequacies in the educational and juvenile justice systems which have resulted in large numbers of learning disabled youth being incarcerated. Citing results of studies which claim that as many as 90 percent of youth in state institutions are learning disabled, Poremba makes a plea for special education programs in the primary grades so that the LD youngsters have a chance to succeed. It is claimed that this is cost-effective because special education for one learning-disabled youth, grades K-12, would cost the taxpayer only $25,000 more than regular schooling, while a criminal career typically costs $500,000.

Poremba, C. As I was saying.... In B. Kratoville (Ed.), *Youth in trouble.* Proceedings of a symposium, Dallas-Fort Worth Regional Airport, May 1974. San Rafael, Cal.: Academic Therapy Publications, 1974. Pp. 74.

In this summary of the symposium, it is concluded that most of the delinquents in this country are learning disabled youth who have never been treated or helped for their disability. Around 85 to 90 percent of delinquent youngsters have learning disabilities as opposed to 20 to 25 percent of the school population. The author believes we are beginning to see a philosophy develop which will insist that every child deserves an education which he can handle and which is meaningful and relevant to him. We may not save all of the kids, but we can't afford to not do something for them.

Prentice, N. M. & Kelly, F. J. Intelligence and delinquency: A reconsideration. *Journal of Social Psychology,* 1963, 60, 327-337.

This report studied Wechsler IQ scores among a randomly selected group of boys admitted to Massachusetts Youth Service Board. The IQ's of delinquents were in the Normal range when measured for perceptual-motor tasks, and in the high Dull Normal range for their verbal skills. The study suggests, however, that the "true" intellectual functioning of delinquents may not be significantly different from that of the general population. Other evidence from the study negated the assumption that a perceptual-motor score substantially higher than a verbal score on the Wechsler scales was diagnostic of delinquency. The authors suggest that the discrepancies between perceptual-motor and verbal scales may be diagnostic of a learning disability among both delinquents and non-delinquents.

Quay, H. C., & Werry, J. S. (Eds.) *Psychopathological disorders of childhood.* New York: John Wiley & Sons, 1972.

The primary outlook of this edited volume rests on the usefulness of the scientific method in studying and treating the psychopathological disorders of childhood. The inherent difficulty of classifying deviant behaviors in children is pointed out. Basic patterns of aggression, withdrawal, and immaturity are revealed through multivariate statistical analyses. Several works in this volume are based on clinical studies found primarily in medical and psychiatric literature. A new perspective is presented on community organization and planning for the deviant child and his environment. Experimental studies are reported on, as well as guidelines for parental behavior and educational programs for problem children.

Rice, R. Educo-therapy: A new approach to delinquent behavior. *Journal of Learning Disabilities*, 1970, 3(1), 16-23.

This program utilized behavioral modification procedures, remedial education techniques, and an enriched social-cultural-personal improvement program in a treatment procedure for delinquent girls. Ten 11-15 yr. old delinquent girls, who were evaluated as having learning and/or behavior disorders, participated in an intensive, in-depth program which occupied their total life space for 3 months. Behavioral and educational improvements are documented by subjective evaluations by the institutional and project staff and posttest scores. It is suggested that this intensive approach to educational remediation and behavior therapy is more economically feasible than long-term incarceration without treatment.

Richmond, J. B., & Walzer, S. Biological and social factors in early development: Implications for child care programs. In S. Glueck & E. Glueck (Eds.), *Identification of predelinquents: Validation studies and some suggested uses of Glueck Table*. New York: Intercontinental Medical Book Corporation, 1972. Pp. 132-142.

Biological factors and learning deficiencies related to delinquency and the Glueck studies are discussed along with the need for programs influencing the direction of human development. Being fully aware of the relationship between the biology of the child and the environment, the Gluecks realized the role which early central nervous system insult might have in contributing to the causation of delinquent behavior. Nutrition, sex chromosome number, and pollution are the biological factors involved in development. Most delinquents are poor students and tend to be retarded in reading. Since programs designed to foster growth and development may not sustain their impact, followup programs are recommended. Centers and programs to systematically guide parents, young children, and prospective parents in the requisites of mental health and contented family life should also be available.

Segal, S. S. Retarded readers and anti-social young people: An English study. *International Journal of Offender Therapy and Comparative Criminology*, 1973, 17(3), 297-302.

Retarded readers and antisocial youth were studied in England. Educational, intellectual, psychiatric and other handicaps were correlated with antisocial behavior. Antisocial behavior is so widespread and varied that the thumbful of detected delinquency is a rather doubtful sample. The danger is that studies of captive populations are used to feed prejudices and not as an aid for constructive prevention.

Senna, J., et al. Delinquent behavior and academic investment among suburban youth. *Adolescence*, 1974, 9, 481-494.

Investigated was the relationship between delinquent behavior and academic investment among 296 suburban male senior high school students. Responses to delinquency and school performance questionnaire items were factor analyzed and correlated. Results provided little evidence for the existence of a generalized delinquency factor among suburban high school youth. Intercorrelations among the six derived delinquency factors was positive but low. A slight generalized tendency for delinquent behavior to vary negatively with school performance was observed. Results suggested that the creation of academic programs in which suburban delinquent adolescents might excel would not decrease the incidence of delinquent behavior in suburbia.

Sheppard, B. Making the case for behavior as an expression of physiological condition. In B. Kratoville (Ed.), *Youth in trouble*. Proceedings of a symposium, Dallas-Fort Worth Regional Airport, May 1974. San Rafael, Calif.: Academic Therapy Publications, 1974. Pp. 24-26.

The speaker cites several anecdotes which show the relationship of disruptive behavior to organic malfunctionings. He is convinced that there are chemical and medical reasons for learning disabilities and behavior problems and is concerned that judges may not have enough medical data before pronouncing sentence. He suggests that screening programs be started that focus on early recognition of learning disabilities and which can provide a complete profile of the child, including an EEG, the sugar tolerance test and some allergy studies.

Silberberg, N. E., & Silberberg, M. C. School achievement and delinquency. *Review of Educational Research*, 1971, 41(1), 17-33.

In this review of the literature on the relationship between school achievement and delinquency, the authors make the point that the school has largely been absolved from responsibility for contributing

to delinquency, despite the fact that delinquents are frequently low achievers and maladapted to school. They are particularly concerned that the evidence seems to support a correlation between reading disability and delinquency. It is concluded that one does not cause the other, but that both conditions are manifestations of a dysfunctioning in the central nervous system. The evidence of similar abnormal brain wave patterns in delinquents and reading disabled youth leads to the inference that the impact of the general culture is less significant in generating delinquency than are the biologic endowments of the individual and the parental influences in the formative years of early childhood. The school can intervene, by providing opportunities for success, although it cannot change the biological endowment or childhood experiences. Both delinquents and reading disabled youth are generally low in linguisitic skill and abstract conceptual abilities, but rely heavily on concrete thought. They could probably succeed in a curriculum emphasizing concrete experience and realistic vocational preparation instead of abstract linguistic skills.

Staats, A. W., & Butterfield, W. H. Treatment of non-reading in a culturally deprived juvenile delinquent: An application of reinforcement principles. *Child Development*, 1965, 36, 925-942.

A 14-year old Mexican-American delinquent boy, who had a long history of school failure and misbehavior and second-grade reading achievement, was given 40 hours of reading training which extended over a 4½ month period. Science Research Associates reading materials were adapted for use in conjunction with a token system of reinforcement. During training, the subject's attention and participation were maintained by using reinforcers. He made many new reading responses and learned and retained 430 new words. The boy's reading achievement increased to the 4.3-grade level, he passed all his courses for the first time, and his misbehaviors in school decreased to zero.

Stenger, M. Frequency of learning disabilities in adjudicated delinquents. Masters thesis at the University of Missouri-Kansas City, Kansas City, Missouri, 1975.

Sixty-seven white juveniles adjudicated delinquent for the first time were separated into 3 groups on the basis of school reports and the results of the administration of the Wechsler Intelligence Test and the Wide Range Achievement Test (WRAT). Group I consisted of the 31 delinquents who did not exhibit school difficulties. Group II consisted of 21 delinquents who performed in the dull/normal range on the Wechslers and who were achieving in their ability range in school. Group III consisted of the 15 (22 percent) delinquents classified as learning disabled on the basis of: (1) a 15+ point discrepancy between the verbal (VIQ) and Performance (PIQ) scales on the Wechslers; or (2) had a subtest score 3 points different from the mean of their scale scores; and had achievement levels on the WRAT below their ability range. It was hypothesized that the LD group: (1) would be

lower VIQ than PIQ; (2) scores on Information and Vocabulary subtests would be lower than for Group I; and (3) WRAT scores in Reading, Spelling and Arithmetic would be lower than for Groups I and II. Results showed that Group III delinquents mean scores on the Wechsler were within the normal range, but that their VIQ was significantly lower than their PIQ as expected. Group III was significantly lower than Group I on VIQ, FSIQ and on 5 Wechsler subtests including Information and Vocabulary, and on reading, spelling and arithmetic subtests of the WRAT. (Differences on the WRAT between Groups II and III were not significant.) The discussion highlights the importance of distinguishing between slow learners (Group II) and learning disabled (Group III) youth in remedial programs.

Tarnopol, L. Delinquency and minimal brain dysfunction. *Journal of Learning Disabilities*, 1970, 3(4), 200-207.

This study population consisted of 102 male youths, aged 16-23, who were primarily nonwhite, delinquent, school dropouts. A substantial amount of untreated medical and dental problems were found in the group. "Fifty-eight percent were reading below the sixth-grade level, and 64% were below the sixth-grade level on the Gates Reading to Understand Directions test. On the Bender Visual-Motor Gestalt test, only one-third were in the normal range. Other tests indicated that most visual-motor problems were related to visual-motor integration and motor coordination." The author contends that the deficiencies found among these youth are symptoms of "the minimal brain dysfunction syndrome which is related to learning disabilities." The evidence from this research supports the hypothesis that "a significant degree of minimal brain dysfunction exists in the minority group, delinquent, school dropout population." The author suggests treatment programs encompassing diagnostic testing and prescriptive teaching beginning in the preschool years.

Tokyo, I. S.-I. Current status and trends in juvenile correction -- therapeutic education of mentally retarded and emotionally disturbed juveniles. *Keisei: Japanese Journal of Corrections*, 1974, 85(6), 25-29.

Therapeutic education for mentally retarded and emotionally disturbed juvenile delinquents at the Tokyo Medical Juvenile Reformatory is reviewed. The Reformatory was established in 1949 purely to treat mentally retarded juveniles; the service expanded in 1971 to emotionally disturbed delinquents as well. Therapeutic education includes traditional school subjects as well as occupational guidance, athletic and recreational activities, milieu therapy, and group counseling.

Wacker, J. A. *The reduction of crime thru* [sic] *the prevention and treatment of learning disabilities.* Report to the National Institute of Law Enforcement & Criminal Justice, Law Enforcement Assistance Administration, September 1974.

The author asserts that a new approach to the reduction of crime is required, due to recent research which links learning disabilities to juvenile delinquency. Biological malfunctions, resulting in learning disabilities, pave the way for later anti-social, delinquent behavior. Thus, "if we can prevent and/or treat the learning disability, a fantastic possibility exists for the reduction of crime," the author contends. Recent literature describing the relationship between learning disabilities and juvenile delinquency is cited, and excerpts quoted, with the conclusion that disabilities should be treated, and ultimately prevented, in order to help the youth of our country and to reduce crime. The author proposes a seven-point research program that is both multidisciplinary and interdisciplinary. Etiology should be researched, and the most productive type of therapy should be emphasized. It is suggested that, for the information gathered from this research to be most effective, it must be disseminated to parents, educators, social workers, researchers, psychologists, psychiatrists, physicians, and law enforcement and judicial personnel.

Walle, E. L. *Communicative disorders of juvenile delinquents and young adult criminals.* Paper presented at the International Conference of the Association for Children with Learning Disabilities, Atlantic City, New Jersey, February 1972.

Findings on the incidence and severity of communication problems among defective delinquents--sociopathic offenders--were presented for a group of young men confined to Patuxent Institution at Jessup, Maryland. Incidence and severity of problems reported in this paper were conveyed in statistical tables and reinforced by the presentation of three case descriptions. The case studies reveal the complexities of typical problems encountered. The disorders are not isolated; many are, in fact, multiple disabilities. Of 63 unduplicated communication problems detected from a sample of 128 young, male prisoners, 48.3% had difficulties and were in need of immediate, intensive clinical work. The incidence of communication disabilities were clinically significant and appeared as follows: 34.9% with articulation problems; 34.9% with hearing difficulties; 17.5% with stuttering problems; 9.5% with voice disorders; and 3.2% with language impairments. In July of 1970, a full time speech pathologist-audiologist was assigned and clinical equipment for a therapeutic program for communication problems was set up at Patuxent. The author calls for similar therapy and specialized attention to criminal offenders with communication problems, in an effort to return them to productive citizenship.

Woodworth, D. G. *The effects of laws governing youth employment and school attendance on youth offenses and delinquency.* Menlo Park, Calif.: Stanford Research Institute, December 1965.

This report deals with three major problem areas -- education, employment, and crime -- facing the nation and its youth today. Specifically, the report addresses itself to the effects that school attendance laws and child labor laws have on the incidence of youth offenses and delinquency. It was further limited to the investigation of delinquencies in males, ages 12 through 17. Field case studies were conducted in ten locations, followed by literature searches and analysis of statistical data from federal and local agency reports. The study results do not support the hypothesis that a relationship exists among youth offenses and delinquency, compulsory school attendance laws, and child labor laws. Other conclusions of the study were that: (1) Youths' behavior with respect to school attendance and employment was not influenced by child labor and compulsory attendance laws; (2) Youths who are out-of-school and out-of-work are likely to become greater delinquency risks*; (3) Enforcement of a child labor law that closes most employment opportunities for youth does not necessarily result in an increase in youth crime; (4) Youth crime does not appear to represent hostile or aggressive acts, such as crime against persons. Recommendations for government action are included that relate to education, employment, and other problems of youth.

*See annotation for Elliott & Voss, *Delinquency and Dropout.*

Work Training Program, Inc. *Study of reading disorders in relation to poverty and crime: Final Report to U.S. Department of Labor, Manpower Administration, Office of Research and Development.* Santa Barbara, Calif.: Author, April 1972.

A follow-up study was made of 83 dyslexic job trainees who were given reading and writing remediation as part of a manpower training program. The purpose of the study was to determine if, three years later, they had regressed or continued to function on a higher socioeconomic level than before undergoing training. When training began 69% of the dyslexiacs (herein defined as disabled readers unable to learn by means of conventional teaching techniques) were totally dependent on welfare. Three years after training 25% were on welfare and 45% had obtained and retained full-time jobs. The study also examines the effects of reading remediation on two other dyslexic groups in Santa Barbara County: students in a City College continuing education class and students in a high school for delinquent boys. Substantial improvements in social attitudes and self-esteem occurred with reading remediation in all three groups. Other significant findings and inferences are given for the combined groups. Among the group of boys in a special correctional camp, 46% were dyslexiacs. Within an average stay of five months, all the dyslexic students made rapid progress and learned to read at a functional level. At termination, 6% of the boys remained at the 0-3 grade levels, compared to 23.5% prior to admission; 48% were at the 7-12 grade levels, compared to 37% previously; and one student advanced to grade level 16 in reading.

Appendix F.

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